

JPRS Report

Science & Technology

Europe Economic Competitiveness

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Science & Technology

Europe

Economic Competitiveness

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17 January 1992

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S&T POLICY

European, U.S., Japanese Technology Strategies Discussed

92MI0050 Duesseldorf *HANDELSBLATT* in German
24 Oct 91 p 8

[Text] The technological interdependence between the regions of the triad is constantly growing. The mutual involvement of Europe, Japan, and the U.S. is such that we cannot expect Europe to be increasingly reduced to a "colony" of the high tech superpowers U.S. and Japan. This is how, at the "Technology Makes Europe" workshop, Berlin political scientist Michael Wortmann tried to refute the frequently heard arguments that Europe is in a technological decline.

At the annual conference of the German Political Science Association (DVPW) in Hannover, scientists from Germany and abroad were discussing the problems and challenges of modern technology policy in Germany and Europe, something new for political science, as workshop leader Werner Suess emphasized. Suess had been expecting important stimuli and lively controversy for the new field of political science, and he was not disappointed.

Wortmann and his assumption of a growing interdependence among the triad, from which he claimed Europe had "profited greatly," came under a lot of pressure. Juergen Gabriel and Wolfgang Gessner from the VDI/VDE [German Engineers Association/German Electrical Engineers Association] Technology Center in Berlin noted the opposite trend, speaking of an "increasing technological lag" compared with Japan and the U.S.

Technological Lag Compared With Japan and the U.S.

The only way the European Community could counter this trend was by making greater technological efforts. Total spending on EC R&D policy was around 3.1 billion German marks [DM], equivalent to 4 percent of public spending and only 2 percent of R&D expenditure in Europe.

Gabriel attributed Europe's decline to "structural deficiencies" in the various sectors. European firms were grossly underrepresented in the consumer goods industry, for example. A large number of studies at home and abroad had shown that Europe played a subordinate role internationally in almost all fields.

Although in the electronics industry growth forecasts were positive overall, the European part was being obliged to cut back. The trade deficit in the electronics sector was around DM62 billion and growing. This could have serious consequences for the European electronics industry's 8 million or so employees, Gabriel said.

He pointed out that there were "inadequate links" between basic research, applied basic research, and production. Moreover, cooperation between research and

companies was underdeveloped. Nevertheless, Wortmann countered that Europe had a considerable competitive edge in the key technologies of microelectronics and computers. Agreeing with Konrad Seitz, for many years an adviser in the German Foreign Ministry, Wortmann forecast a future in which military power would increasingly give way to a struggle for supremacy on the world's high technology markets.

But, Wortmann went on, there was at the same time another factor working against this scenario. The major protagonists of technological progress, the multinationals, were rapidly being internationalized.

R&D Increasingly Internationalized

In a study prepared for the German Trade Union Federation (DGB) entitled "The Internationalization of Research and Development," Wortmann and co-author Christoph Doerrenbacher found that in multinational enterprises the international flow of technology was from the parent companies, in which innovative R&D was concentrated, to the subsidiaries.

In Wortmann's words: "For some time these enterprises have been forcing the pace not only for the international utilization but also for the international development of new technologies." The two authors point to the great significance of both intra-European and transatlantic cooperation for European enterprises and warn against "moves towards self-sufficiency" in EC R&D policy, which could be counterproductive. This argument was largely supported by Edgar Grande and Juergen Haeussler of the Max Planck Institute of Social Research in Cologne. These two scientists pointed to the lack of realism in Euro-centered plans.

Wortmann saw the European Community playing a questionable role here: "The EC's R&D policy is aimed at making Europe technologically self-sufficient. Interregional interdependencies become positive elements in its strategy only when such cooperation seems unavoidable if Europe is not to fall irretrievably behind the rest of the world in a particular field of technology." Generally speaking, the intention was to dismantle interdependencies. The scientists saw the EC's objective as being to prepare for a technology war, in particular with the high-tech power Japan.

In this connection, it was the duty of political science to clarify and analyze how these trade wars were conducted. Another point was the question of what position the multinationals would occupy in these new forms of conflict and to what extent these trade and technology disputes ran counter to their interests.

The workshop found that there was also a considerable need for research in connection with the regionalism debate. Werner Suess, from the Politics and Technology Unit of the Free University of Berlin said: "The geographical effects of the integration process of the 1980's have not been adequately investigated; nor is there any consensus as to the extent to which the region is an

appropriate level for technology policy to operate on if it is to embody the notion of a Europe of regions."

Taking the example of small and medium-sized enterprises in the Berlin region, Suess and his colleagues showed that "overall, a regional policy geared to innovation" could "only be credited with relative success." Despite regional support networks, no concerted policy was discernable. The scientists regretted that there was no plan for the modernization of regional enterprises. A regionally effective technology promotion policy geared to small and medium-sized enterprises was virtually nonexistent.

EC Support for Key Technologies Urged

92GE0117X Duesseldorf *HANDELSBLATT* in German
27 Nov 91 p 9

[Article by rg: "Economic Planners Are Not Prepared for the New Industrial Revolution. Planning Staff Director Konrad Seitz Warns of Technological Decline. BDI Skeptical"]

[Text] Bonn, 26 Nov—Long-range industrial policy strategies are called for with increasing urgency: In the opinion of Konrad Seitz, head of the Planning Staff of the Foreign Office, science, politics and the economy must carry on an intensive dialog in order to counter the technological challenges from the Americans and the Japanese.

"Unless we turn around the trends of the 1980's, Europe will become the technological colony of the global Japanese and U.S. companies," says Seitz in a conversation with the *HANDELSBLATT*. His analysis of the competition is a gloomy scenario: "Europe is in the process of losing its semiconductor, computer and entertainment electronics firms." And once these key areas have broken off, it is only a question of time before the German and European industries will have to leave the sectors in which they are still strong: Transmission and communications systems in telecommunication, industrial automation, automobile and medical electronics.

Europe in 2000 will, according to his view, then be without its own information technology companies. The danger is that the continent "will become a technological colony, in which the Europeans merely supply the workers and the middle management for Japanese factories."

This analysis was recently discussed by the Federation of German Industries (BDI). Seitz believes that his views have been confirmed at least by the analysis of leading representatives of the German electronics industry and machine building. But the conclusions which must be drawn from this analysis are controversial. Officially, the BDI made it clear last week that the existing instruments of economic and financial policy are sufficient.

The presidium warned emphatically against expanding the European agreements with a section on "industrial

policy." Some economic policy makers and association representatives sense a danger for the market economy behind the calls for industrial policy measures.

Seitz, on the other hand, complains that orthodox economic theory and policy regards all industries as equivalent according to the motto: "Potato chips or computer chips—what is the difference?" The question of which chips a country then produces is answered according to the theory of comparative advantages, according to which each country has naturally given relative advantages for certain products over other countries. "This purely statistical theory is inadequate for the times of an industrial revolution, such as we are experiencing today," according to Seitz.

If the Japanese had acted in accordance with this theory, they would today still be exporting textiles and toys, argues the planning chief. In high-technology industries it is not a matter of "comparative advantages" but of "first mover advantages." The development costs for large aircraft, for example, and the effects of learning are so great, that the saying goes: "He who is the first to build the industries keeps them."

Seitz tries to explain the danger of unilateral dependence on the Japanese by using the example of production and test equipment for chips. The General Accounting Office recently made it clear in a report to the U.S. Senate that U.S. semiconductor manufacturers can only obtain these devices from the Japanese after a waiting period of 18 to 22 months—when the next equipment generation is already in place in Japan.

Seitz envisions the following guidelines for a German and European industrial policy:

- No protectionist sealing off of the market, no subsidies (with the potential exception of subsidies for the semiconductor industry, in order to make the gigantic investments possible which are necessary in order to "achieve a critical mass in the global marketplace").
- Accelerated buildup of the infrastructure for the information society: broadband communications networks all the way to individual households, super-computer networks, traffic control systems. Such programs have resulted in both a rise in demand and a technological impetus.
- Support for company cooperations and mergers, with which Europe could stand up to the U.S. and the vertically integrated Japanese conglomerates. The German as well as European cartel laws should finally be oriented toward the competitive conditions on the world market.
- Tax incentives for research and development and for investments in "strategic industries."
- Alliances with U.S. companies, along the model of the Siemens-IBM alliance for developing the 64-megabit memory chip.

- Alliances with Japanese companies as well; these should be set up, however, so that European companies will not become increasingly more dependent on the Japanese partners, but, on the contrary, would secure and strengthen their high-technology position.

Since the European companies are usually inferior to the Japanese partners in information technology, such alliances with equal rights can only be achieved with "political support." Seitz points to the U.S.-Japanese semiconductor agreement. Thanks to this agreement, U.S. semiconductor manufacturers have increased their share of the Japanese market since 1986 from 8.5 to 13.5 percent; it is to reach 20 percent by the 1992.

This agreement created an entire network of cooperations by U.S. and Japanese semiconductor manufacturers: Toyota, together with Motorola Chips, develops them for automobile electronics; U.S. and Japanese semiconductor producers are jointly developing chips for the future mass market of Japanese high-resolution television; etc. Says Seitz: "The Japanese are definitely willing to cooperate with the Europeans, if only the German and European political sector would finally request this cooperation."

Seitz regards it as impossible to implement a German or European MITI [Ministry of International Trade and Industry] and also "not desirable, since here it would probably only be misused for subsidizing the old industries, for which there is a political lobby." But MITI's central function should be fulfilled in another, suitable manner, namely the organization of a permanent and systematic dialogue between state and industry. "This is the only way we can incorporate orientation for the future into our politics and society and develop concepts for establishing the information society."

Seitz leaves no doubt that Europe possesses the strength to meet the Japanese challenge. It has the large domestic market, the financial resources and, above all, it has well-trained people. "What has been missing until now is a general awareness of the challenge and the will to accept it. We must not fragment ourselves over individual problems, but must finally concentrate our energies on the major tasks," Seitz says.

If this were to succeed, he predicts a brilliant future for Europe. His vision is for a large society including all of Europe, consisting of the present 12 EC nations, the six EFTA countries, and the countries of Central and East Europe. This would be a community of 415 million people and the largest and most polyglot economic area in the world. The tremendous need to catch up in East Europe would be responsible for a strong economic dynamic. Says Seitz: "If this Europe keeps pace with the high technologies, at the beginning of the 21st Century it could be the richest and most creative region of the Europe-United States-Japan triad."

EC Council Approves Electronics, Communications Resolution

92WS0208A Brussels EUROPE (Documents supplement) in English 22 Nov 91 pp 1-4

[Article: "Guidelines for Community Policy in the Electronics and Information Sectors"]

[Text] On 18 November the Industry Council approved a resolution which defines the guidelines for Community policy concerning the electronics and information sectors. This by no means envisages interventionist industrial policy but is in order to create conditions, through concrete measures, in which European industry in these vital sectors may become competitive at world level, notably with a view to reducing the EC's trade deficit in this domain (which is very considerable). The guidelines retained cover trade policy, research, the Single Market, normalisation, competition policy, etc. The Commission is invited to take certain specific measures and the Member States to take the appropriate measures for achievement of the above objectives.

Council Resolution

of 18 November 1991

Concerning Electronics, Information and Communication Technologies The Council of the European Communities

Having regard to the Treaty establishing the European Community,

Having regard to the Communication from the Commission concerning industrial policy in an open and competitive environment: guidelines for a Community approach, (x)

Having regard to the Communication from the Commission concerning the European electronics and information technology industry: state of play, issues at stake and proposals for action, (x)

Whereas the approach of the Community to industrial policy centres on the completion of the single market and the application of the competition rules at international level to ensure, on the basis of a balance of rights and obligations, that competitor's markets are as open as the Community market;

Whereas the Community's electronics, information and communication technologies have a paramount importance for the competitiveness of the Community's economy;

Whereas equal access to markets and fair competition on a global scale is as a matter of urgency first priority in the areas of electronics, information technology and telecommunications; whereas the Community aims at the positive and timely conclusion of the current GATT negotiations;

Whereas the main responsibility for improving industrial competitiveness lies on the economic actors themselves, but public authorities have to provide them with a clear and predictable framework for their activities;

Whereas trans-European networks and computerised telecommunications links between administrations and services of general interest shall respond to user needs;

Whereas the Community's support for research and development, in particular on areas which are vital for the development of technology and its application by users, is a significant contribution to the future competitive position of this industry; whereas industrial cooperation is to be encouraged, to develop in Europe key technologies which are internationally competitive in particular in a long-term perspective;

Whereas small- and medium-sized enterprises are important as innovators and disseminators of these technologies; whereas aspects of economic and social cohesion and regional development have to be taken into account;

Whereas the use of electronics, information and communication technologies within the European economy depends crucially on the availability of people with the relevant skills;

Has Adopted This Resolution:

The Council:

1. Emphasizes that, in order to support the Community's pledge to free and fair international trade and competition:

- the Community must be in a position to ensure rapid and effective action against unfair competition and practices;
- the efficiency of the Community's trade policy instruments, such as anti-dumping, should be enhanced in order to promote free and fair trade;
- the Community should continue to support the establishment of more effective multilateral rules on non-discriminatory market access for users and suppliers, including compliance measures;
- the Community should maintain its efforts to support the establishment of competition rules, with a view to achieving the elimination of practices restraining competition and their effective application in each of the Community's main trading partners;
- the GATT rules should be further developed and improved with regard to their effectiveness.

2. Takes the view that in the light of the results of the Uruguay Round negotiations additional bilateral initiatives of the Community, without prejudice to existing GATT obligations, may be necessary to create effective market.

3. Understands the need for a more systematic gathering of information on marketing, market access and distribution practices throughout the main industrial areas in the world.

4. Emphasizes the importance of a favourable business environment for improving the competitiveness of electronics, information and communication technology industries; specifically taking into account the role and interests of users; giving special consideration to small- and medium-sized enterprises as well as to regional development.

Means for improving the business environment include:

- full and effective implementation of all the relevant measures, in particular those concerning public procurement, aimed at creating the unified market in the Community, including the application of a system of effective competition;
- speeding up the process of European standardisation and certification to meet the requirements arising from the creation of the internal market;
- reviewing present-day financing systems in the Community, e.g., with regard to the provision of risk capital;
- the infrastructure for co-operation between enterprises of all sizes;
- facilitating co-operation, without distortion of competition in the internal market, between individual enterprises, such as microelectronics, in order to be able to compete on world markets;
- strengthening the competitive position of subcontractors so as to permit them to meet the exacting and developing needs of contractors;
- promoting rules and mechanisms comparable to those in the internal market with a view to create a level playing field for European industry in world markets, in particular in the areas of public procurement, standardisation and certification, distribution, competition policy, strategic alliances and foreign investments.

5. Emphasizes the need for trans-European networks and computerized telecommunication links between administrations and services of general interest taking account, insofar as action by the Community is concerned, of decisions to be taken in the appropriate Community fora.

6. Is convinced of the necessity for industry in the Community to be competitive at a world level, particularly when assessing strategic alliances and capital intensive investment in the framework of the rules of competition.

7. Also is convinced that steps should be taken to strengthen the efforts of the Community's R&D activity taking into account also the interest of small-and medium-sized enterprises:

- By focusing in the relevant programmes on areas which are vital for the development of technology and its application by users;
- Priorities should be established and the financial means provided by the Community budget insofar as possible be allocated accordingly;
- A better synergy between R&D carried out in the Community programmes and EUREKA [European Research Cooperation Agency] is to be promoted while maintaining [words illegible].
- Measures should be taken for the dissemination and exploitation of R&D results to users across the Community.

8. Emphasizes the need for enhancing efforts relating to the provision of training at all levels in electronics, information and communication technologies above and beyond the current efforts being made by Member States and at Community level.

Invites the Commission:

1. To report on:

- relevant studies undertaken by the Community and its Member States;
- the most recent agreement between the United States and Japan concerning semiconductors, as well as its consequences for European producers and users;
- the present-day situation of market access in third countries;
- government practices in the field of electronics, information and telecommunication technologies in the Community and its major trading partners.

2. To establish a centralised point of information, possibly within the Commission services, charged with monitoring marketing, market access and distribution practices throughout the main industrial areas in the world.

3. To monitor, in consultation with a high level group composed of representatives of Member States, and with respect to trade-related matters with the Committee referred to in Article 113 of the EEC Treaty, the progress in achieving the goals set out in this resolution, and to report, at regular intervals and at least once a year, on the progress achieved.

Invites the Member States and the Commission:

To take, and where required propose, the measures necessary for reinforcing these basic principles and for pursuing the achievement of the goals set out in this

Resolution. These measures should be initiated concurrently as a matter of urgency.

EC Releases 9.3 Billion Francs for Third Framework Program

92WS0096B Paris LE MONDE in French 31 Oct 91
p 13

[Article: "Ministers of the Twelve Release Close to 6 Billion European currency units [ECU] for Research"]

[Text] On Monday 28 October in Luxembourg, research ministers of the Twelve approved four research programs costing a total of ECU1.33 billion (about 9.3 billion French francs [Fr]). These programs are in addition to 10 [already-approved] programs included in the third five-year "framework program" adopted in principle in December 1989.

It has taken nearly 2 years for the various institutions of the European Community to reach agreement on the third five-year "framework program" for research and technology development. It was 19 December 1989 when ministers of the Twelve, with France presiding, gave their approval in principle to the plan, which involves outlays totalling ECU5.7 billion (Fr39.8 billion) and covers the period 1990-1994 (LE MONDE of 21 December 1990). But it was never implemented, due to a dispute between the Council of Europe, the Parliament, and the European Commission over modalities of implementation. Among other things, there was disagreement over the access of non-Europeans to the research programs.

The impasse was broken in a tripartite meeting last March. The ministers then proceeded to adopt 10 specific programs in June and September. Added to the four others adopted Monday, almost the entire framework program has now been approved. Approval for a small final group of meteorological programs should follow in the weeks to come.

Among the measures adopted Monday, the program called "Human Capital and Mobility" was awaited most eagerly by the scientific community. The goal of this ECU518 million program is to strengthen European research by augmenting the number of researchers through various incentives (training scholarships, development of scientific cooperation networks). The EEC has about 580,000 research workers, or about 4 researchers for each 1,000 inhabitants, compared to 7.7 in the United States and 7 in Japan.

The Twelve also adopted a research and development program in the field of biotechnology (ECU162.3 million), a research program in nuclear fission safety (ECU198 million) and an action program in the field of controlled nuclear fusion (ECU458 million).

With regard to the latter, according to sources in the Ministry of Research and Technology in Paris, France has emphasized the need to "proceed one step at a time."

Research Minister Hubert Curien has told his colleagues it would be wise to concentrate more on basic research, so European experience can be brought to bear when the time comes to start building an experimental reactor in collaboration with the United States and Japan, at a site as yet undetermined.

Changes in EUREKA, JESSI Budgets Discussed

92WS0110B Paris LES ECHOS in French 25 Oct 91 p 12

[Article: "JESSI's [Joint European Submicron Silicon Initiative] Funding Revised Down"]

[Text] The members of EUREKA's [European Research Coordination Agency] biggest program (26.5 billion French francs [Fr] over nine years) have just decided to trim its budget to 400 million European currency units [ECU] (Fr2.8 billion) for 1992. Indeed, more and more countries (which foot 50 percent of the bill, while the remainder is paid by the manufacturers) are requiring considerable nudging to come up with the funding for the program, supposed to ensure the competitiveness of European electronics against Japan. Philips bailed out of one of the subprograms (on static memories), the Germans have cut their budget, and even France is not up to date in its payments.

But the worst payer is still the EC. Although it fought for a certain leadership role by contributing 25 percent of the total, it recently made known its desire to see its share halved. And its promised funds never arrived, thereby shrinking the budget by 25 percent.

JESSI is weakened both by its chaotic financing and the way it is organized. During the last EUREKA meeting in La Haye last June, member countries signaled their desire to see the large number of JESSI subprograms reduced, in order to facilitate management. This is now an accomplished fact, since the "board" members decided to regroup around a few key projects such as HDTV [high-definition television] components, mobile telephones, ISDN [integrated services digital network] networks, lithography, and components manufacture.

Bull, Siemens, Olivetti Plan Joint Computer Research Programs

92P60025 Paris LE MONDE in French 18 Sep 91 p 19

[Article: "Bull, Siemens, Olivetti Envisage Joint Research Programs"]

[Text] The three European computer manufacturers confirmed on Monday, 16 September, that they signed a preliminary accord within the framework of the European Nervous System (ENS) last August. The EC program is intended to accelerate the economic growth of the computer applications market in Europe. The accord between the three firms was signed following a meeting in Brussels on 6 June 1991 between European authorities

and those of the three groups. Several principal directions for the work were envisioned at that time: trans-European communications networks, training programs, software development, and computerization of the Public Health Services, among others. Bull, Siemens, and Olivetti are now working on the details of these projects in order to propose them to the EC by the end of the year.

"These initiatives are intended to improve our competitiveness and to expand the European computer market for European firms," Francis Lorentz, CEO of Bull, explained at the international seminar that took place in mid-September at Opio in the Maritime Alps.

France: Funding for Biotechnology, Environmental Protection Programs Announced

92WS0078D Paris LE MONDE in French 24 Oct 91 p 42

[Article: "Over 2.5 Billion French Francs [Fr] for Three Big Industrial Research Programs"]

[Text] France preaches by example. Now that it has set the strategic priorities (information science, automobiles, factories of the future, and waste treatment) for its May 1992-June 1993 term as president of Eureka, the state is launching three big new industrial research programs in partnership with the manufacturers concerned. Mssrs. Curien and Strauss-Kan spoke about the programs, which represent Fr2.5 billion in investments, in the Wednesday, 23 October council of ministers meeting.

The largest of them is the Bioavenir program, which was prepared in collaboration with Rhone-Poulenc. It is the biggest both in terms of the sums involved—the state will spend Fr610 million and Rhone-Poulenc Fr1 billion over five years—and the economic stakes. The potential world market for the program's industrial spinoffs is estimated at Fr300 billion annually by 1995. The program focuses on health, agriculture, and chemistry, and will involve the participation of large public research organizations (CNRS [National Center for Scientific Research], INSERM [National Institute of Health and Medical Research], INRA [National Agronomic Research Institute], CEA [Atomic Energy Commission], etc.) It will seek to radically transform the methods used in molecular research.

The second program concerns vehicles and road safety, and will complete the ambitious research project started last year on nonpolluting cars. Like that program, it combines the efforts of the state (the government will ante up Fr218 million) and the two French manufacturers, Renault and PSA (Fr410 million in investments). The remainder (Fr22 million) will be provided by INRETS (National Institute for Research on Transport and Transportation Safety). This time the goal is to increase the "passive" safety of passengers (by improved collision protection) as well their "active" safety through the use of computers and electronics.

Finally, the third program aims to protect the environment and improve the quality of water. Only one household in three is presently hooked up to a purification station, despite the fact that the French consume 250 liters of water a day (14 million daily cubic meters). Sixteen research projects have been drawn up to remedy the situation. They will bring together the industry's two companies, the General Water Company and Lyonnaise-Dumez, and the state's public laboratories, which will furnish over a third of the necessary Fr300 million.

France Calls For Fair Relations in Electronics Trade

91AN0551 Paris *ELECTRONIQUE INTERNATIONALE* HEBDO in French 5 Sep 91 p 6

[Article by Michel Heurteaux: "France Calls For Joint Action for Europe"]

[Text] The sector is in desperate need of rescue and, according to Paris, this can only be achieved with effective EC support. All that is required is consensus....

Determination reigns! French officials are once again mounting a "Brussels" campaign on the very delicate question of the electronics industry and are advocating a real common policy. In a memorandum to the European Commission at the beginning of the summer, the French Government reiterated and developed a series of arguments with a view to supporting this increasingly threatened industrial sector. Some of these arguments had already been proposed in the latest report by the General Planning Commissariat, entitled "An Emergency Strategy for Electronics." The acquisition by the Japanese firm NEC of 4.7 percent of the capital of Bull, which was finally confirmed by the government, or the agreement concluded between IBM and Siemens on components, have not yet signed the death certificate of the barely outlined EC electronics policy, said Industry and External Affairs Minister Dominique Strauss-Kahn, presenting the memorandum.

"The economic and strategic challenges require that Europe is and remains technologically independent in the field of semiconductors and its main outlets, namely computers, electronics, and telecommunications," the document specifies, which also emphasizes a series of weaknesses both at the level of industrial organization and competitiveness.

In the face of a "serious and structural" crisis, which was already analyzed in a recent communique by the Commission entitled "Findings and Challenges for the European Electronics and Computer Industries," France notes that there is a need to go beyond a simple statement of fact and to take a series of measures which could lay the foundations for a common industrial policy in Europe. According to the French Industry Minister, the EC should intervene at two levels: ensuring a competitive environment and strengthening European cooperation. According to the memorandum, the situation is most unbalanced with American and Japanese industries

controlling 90 percent of their domestic markets while Europe controls only 40 percent of its home markets.

France has invited its European partners to draw up a pragmatic, negotiated response. "The liberal character of EC legislation in this field places the Community in a good position to demand that its partners open up their markets in the context of the GATT negotiations." However, Paris is under no illusion and knows from experience that the fight for increased free trade remains as difficult as ever. If this liberalization does not come about, "Europe will have to increase its efforts and not hesitate to impose its directives when they include a reciprocity clause and to examine the possibility of adding reciprocity clauses in directives which do not already contain them."

Furthermore, France is recommending a series of measures aimed at restoring the balance of trade, maintaining customs duties at 14 percent on integrated circuits developed within the scope of the Joint European Submicron Silicon Initiative (JESSI), as well as at improving the EC's antidumping procedures. This position is, on paper at least, far from winning the unanimity of the 12 member states, the main opponents being the self-proclaimed liberals like Great Britain, the Netherlands, and, to a lesser extent, Germany.

Priority to the Semiconductor Industry

The second key point in these recommendations is industrial cooperation, in which priority would be given to closer cooperation between semiconductor manufacturers. The memorandum recommends the establishment of partnerships between users and components suppliers. Increasingly closer links between systems, finished products, and the components they use are practically imposing a near verticalization of the electronics industry, similar to what is happening in Japan. The inadequacy of this kind of integration in Europe should lead manufacturers to consider ways in which such developments might be achieved. These could include the purchase of shares in European groups by users or the creation of joint research centers between users and components manufacturers.

Finally, last but not least, if the European electronics industry is to be rescued, major European projects, such as that on high-definition television (HDTV) and JESSI, must be given greater backing, and this must be accompanied by concerted action on financing investments. The Ministry of Industry thinks that "public intervention, ranging from direct subsidies to producers to new fiscal incentives for investors, will in any case be necessary."

The hardest part is yet to come: Europe must get its act together. Will the French text, which is currently being examined by the Commission, act as the working basis for a future common policy, as Paris would like? While waiting for the next EC round on measures to be implemented, commentators at the EC are making diplomatic statements and qualify the French text as "an interesting contribution to the debate."

Evolution of the Balance of Trade in the Electronics Sector (in million dollars)

| | 1986 | 1987 | 1988 | 1989 | 1995* |
|-------------------|-------|-------|-------|-------|-------|
| Europe | -14.3 | -21.9 | -33.1 | -34.2 | -50.8 |
| United States | -7.5 | -7.2 | -5.2 | -7.7 | -17.9 |
| Japan | 49.5 | 54.3 | 62.6 | 62.7 | 86.8 |
| Rest of the world | -27.7 | -25.2 | -24.3 | -20.8 | -18.1 |

A major challenge for Europe: Its balance of trade deficit has tripled since 1986. (Source: EIC, 1990)

* Forecasts

German R&D Reorganization Discussed

92MI0144 Munich MPG SPIEGEL in German
11 Nov 91 pp 11-12

[Text] German unification offers a unique opportunity for restructuring research. The fundamental reorganization of extra-university research in the new laender is an important step in this direction. The Federal Minister of Research and Technology (BMFT) is using his full powers to expedite this process. His aim, in close cooperation with the laender, is to have the new structure in place by the end of the year. This aim will be realized.

The entire spectrum of well-known and experienced extra-university research institutes in the old Federal Republic will be extended to the new laender, too: three new major research institutes, nine branches of major research institutes, 25 to 30 new "Blue List" institutes, and 35 to 40 new Max Planck Society and the Fraunhofer Society facilities and teams. This means that in the next few months about 40 new research institutes and roughly the same number of research teams will be founded. All this will make German research richer and more versatile. The new institutes will develop fields of research that were covered in only a small way or not at all by the institutes of the old Federal Republic, for example:

- the Molecular Medicine Center in Berlin-Buch,
- the Geo-Research Center in Potsdam,
- the Environmental Research Center in Leipzig/Halle.

It is becoming clear that the new laender, too, will have modern extra-university research facilities in about three years time, and it will not be long before their effectiveness matches the standard of the western industrial nations, with research that does not merely fit into the existing system in the old laender, but is a rational complement to it.

At the instigation of Federal Research Minister Dr. Riesenhuber and in consultation with the then GDR research minister Terpe and the scientific organizations, a comprehensive appraisal of the institutes of the three GDR academies has been initiated. At the beginning of July the Science Council submitted its last major package of recommendations for the future of the institutes of the former Academy of Sciences. It completed

this difficult and responsible task six months earlier than expected.

The appraisal of the former Academy of Architecture too, is already complete. The Science Council presented its recommendation concerning the former Academy of Agriculture in September.

The Science Council put a great deal of work and care into the appraisal, which took almost nine months and involved over 200 scientists from Germany and abroad. In order to obtain a full picture, the experts visited more than 130 research institutes, interviewing on the spot not only their directors but also many individual scientists at their posts. The experts assessed the productivity of the research teams and the viability of their fields, and on that basis prepared proposals for new research facilities and how they should be staffed and equipped.

Now that the results of the appraisal are available, it emerges that some of the east German scientists' research work and findings were of surprisingly good quality, better than many western observers had expected. This is all the more remarkable because research work was often considerably hampered by poor equipment, lack of contact with western colleagues, and political interference. For example, the Science Council makes positive appraisals of 61 percent of the personnel employed by Academy of Sciences institutes in earth, space, and environmental sciences, but of only 11 percent of those in social sciences. Further positive examples are mathematics, physics, and chemistry.

When the new institutes have been set up, 6,400 posts falling under the BMFT will be jointly financed by the federal government and the laender. There will be a further 900 posts at land institutes and around 800 in facilities funded by other federal ministries.

As things stand at present, 400 million German marks [DM] from the higher education regeneration program will enable a further 2,000 scientists to be integrated into the universities, themselves in the throes of a restructuring process, as recommended by the Science Council. The application and approval procedure is already under way. The program, which will run for only two years, will be reviewed in 1992.

Job creation measures for the R&D sector have been very well received. At present, 500 applications for job creation schemes for 2,500 people are being prepared with the support of the Coordination and Winding-Up Office for the Institutes of the Former Academy of Sciences [KAI-AdW]. Schemes employing 250 are already under way. This also serves to bridge the period during which the economy of the new laender is generating only a small demand for R&D personnel, and to preserve and improve scientists' qualifications.

As things stand, these measures will enable more than 12,000 R&D personnel to find a new job in publicly-funded research. They include more than 10,000 former Academy of Sciences employees out of the roughly 17,000 still there. This means that about two thirds of the 17,000 scientists still employed there will be able to find a new job. Of the 4,000 once employed at the former Academy Architecture, 2,800 have already found work, mainly in the building industry. There will be employment openings for 1,200 in land institutes and other newly created research facilities.

Cooperation between the BMFT and the land administrations in the formative phase is working. This is all the more important as speed is of the essence. Under article 38 of the Unification Treaty, the employment contracts of persons employed by the former Academy of Sciences expire at the end of 1991. Transitional funding for the Academy of Sciences institutes that are land facilities terminates on the same date. The BMFT and the new laender have therefore set themselves a tight schedule for setting up the new institutes in the next few months. This is also particularly necessary so that all Academy of Sciences staff will be clear about their professional future. The BMFT is urgently seeking to translate all the Science Council's positive appraisals into new institutes by the end of the year, or at least to lay the foundation stones for them so that funding is guaranteed as from 1992.

Germany: Credits to Small Firms for Research

92P60082 Duesseldorf *HANDELSBLATT* in German
9 Dec 91 p 7

[Text] The Federal Ministry for Research (BMFT) and the government-owned Credit Institute for Reconstruction (KfW) intend to encourage small companies which are open to innovation. A new promotion program will provide cheaper credits to companies with annual sales of up to 50 million German marks [DM]. The duration of the credits, which are intended to finance research and development projects, is limited to ten years at most. Credit to an individual company is limited to DM3 million.

The program will begin at the start of next year and will expire on 31 December 1997. Companies in all branches of industry will be aided, including artisans. The credit will be extended by the company's bank, which will be refinanced by the Credit Institute for Reconstruction. Interest is fixed at 7.5 percent for the entire lifetime of

the credit. The Federal Ministry of Finance will manage the lower interest as compared with the current, much higher market rates for interest. The BMFT and the KfW will share the risk of nonpayment. With this program, the Minister for Research Heinz Riesenhuber (CDU) will ensure that small companies are not cut off from scientific progress. He says that the program closes a gap in financing.

German Joint Research Project Funding Summarized

92MI0112 Bonn *TECHNOLOGIE-NACHRICHTEN*
MANAGEMENT-INFORMATIONEN in German
28 Oct 91 p 2

[Text] Expenditure by the BMFT [Federal Ministry of Research and Technology] on joint projects between private industry and public research establishments or nonprofit organizations (joint industrial research) shows the following trend since 1982:

| Year | Total Expenditure* | Portion Allocated to Private Industry* | Percent |
|------|--------------------|--|---------|
| 1982 | 1,905 | 1,812 | 95 |
| 1983 | 1,565 | 1,421 | 91 |
| 1984 | 1,581 | 1,389 | 88 |
| 1985 | 1,661 | 1,406 | 85 |
| 1986 | 1,305 | 1,087 | 83 |
| 1987 | 1,087 | 848 | 78 |
| 1988 | 1,033 | 760 | 74 |
| 1989 | 943 | 659 | 70 |
| 1990 | 896 | 600 | 67 |

*In millions of German marks [DM]

These figures reflect the BMFT's policy since 1982 of reducing (from DM3,245 million to DM1,656 million) research and development funding to private industry, especially larger firms with revenues of over DM200 million. Overall, savings in Federal Government expenditure were more than offset by increased R&D expenditure by the firms themselves.

Between 1983 and 1989, the BMFT funded 4,916 R&D projects as single projects in private industry. In addition, 759 joint projects between commercial firms and public research establishments or nonprofit organizations were funded over the same period, involving 2,264 grants to commercial firms.

The Federal Government has no information on the extent to which these projects led to the granting of a patent, the exploitation of a patent, and the marketing of a new product.

German Research Society Approves Fewer Projects*92P60088 Duesseldorf HANDELSBLATT in German
18 Dec 91 p 6*

[Text] Despite its budget of 1.5 billion German marks [DM], the German Research Association (DFG) has had to apply sharp economizing measures. For a whole year it will not accept any grant applications from new research groups in the old FRG, nor will it accept applications for particularly expensive equipment.

This was reported by its current president, Professor Hubert Markl, on Tuesday (17 Dec) at a scientific press conference in Bonn. Markl will be succeeded as head of the DFG by Professor Wolfgang Fruehwald (Munich) on 1 January.

Although the federal government and the laender agreed to increase the DFG funds by 5 percent annually until 1995, this is no means sufficient, according to Markl, particularly in view of the addition of support to East German scientists. Already, 8.5 percent more funds have been requested for 1993. In this year, almost one-fifth of the 20,000 applications for grants have come from the new laender. The DFG president spoke of a "considerable potential of effective scientists who are ready to produce." But he also pointed out that at the same time the number of applications from West Germany has increased by more than 14 percent, because the laender have not provided enough research monies to the universities.

According to his account, the results were inevitable: The rate of approval of applications, which had previously been over 60 percent, dropped to under 40 percent in the second half of 1991 and as low as 27.1 percent in November. Markl, who has held for six years the office of president of the largest German organization to promote science, appealed particularly to the laender to provide more funds. Every mark from the laender to the DFG returns to their universities increased by more than 1.5 federal marks, he said.

Addressing the federal government, he called for a reorientation of the state research policy. Thus he expressed considerable doubts as to the use of manned spaceflight with its costs in the billions. In the case of large scale scientific projects, one should "think more globally" and not act from the point of view of competition, as between Europe, Asia, and America. With the background of the latest EC summit in Maastricht, he called for an agreement among the European scientific organizations with the purpose of ensuring the "autonomy of research support" and creating a sort of "European system of the research community."

Germany: Trust Agency Plans Chemical R&D Center*92MI0098 Bonn DIE WELT in German 6 Nov 91 p 14*

[Text] Hopes for a better future are rising in Bitterfeld. This evening sees a conference there, hosted by Sachsen-Anhalt's Minister of Economics, Horst Rehberger, accompanied by two of his state secretaries, together with the Berlin Trust Agency's manager with responsibility for Chemie AG Bitterfeld-Wolfen. Yet these will not be the major personalities of companies planning to invest in Bitterfeld, notably Bayer AG of Leverkusen and Heraeus Electrochemicals GmbH of Freiburg; British and American firms are also expected.

Heinrich Harries, chairman of the supervisory board of Chemie AG (and a full-time director of the Bank of Credit for Reconstruction) expects the conference to provide "steps towards fulfilling the promise by Federal Chancellor Helmut Kohl to retain Bitterfeld as a center for chemicals." He also expects plans to emerge for investment in and the regeneration of what still remains of the former Bitterfeld Chemicals Combine, around half of the companies of which have by now been closed or broken up; and plans for attracting firms to the 500-hectare factory site. The aim is to develop a "chemicals park," with Chemie AG at its center.

The major company in this park will be Bayer AG which will invest 500 million German marks [DM] in Bitterfeld—though not in the vicinity of Chemie AG, but in an adjacent site. Heraeus has also given a firm promise, and plans to build a quartz glass factory in Bitterfeld for around DM100 million. The total of investments committed by the various partners in the chemical park amount to over DM1 billion, according to Chemie AG. Bitterfeld's land representative Reinhold Thiel also reports that a "large mail order company" is considering setting up a subsidiary in Bitterfeld.

The "park concept" originated in the Trust Agency and arose from the underlying realization that Chemie AG Bitterfeld-Wolfen cannot survive in its entirety. By the end of this year it will have around 7,000 employees, compared to the present figure of 10,000, with anticipated revenues of around DM550 million. This is not enough: as Wolfgang Baronius, director of company administration for Chemie AG puts it. "We need revenues in the billions of marks; otherwise, environmentally friendly and economically viable production on a site of this size isn't possible."

Billions are out of the question, however. Chemie AG, whose products range from organic and inorganic chemicals via dyes, pesticides and PVC [polyvinyl chloride] to metals, is faced with the difficult task of finding new markets in the west, now that those it had built up in the east have largely collapsed. The new board, whose chairman Dieter Ambros is from Henkel, while Juergen Gruen is from Hoechst and Dieter Raschke is from Bitterfeld itself, was installed on 1 November. Though it will not be able to capture these new markets tomorrow,

there are nevertheless high hopes in Bitterfeld for the new management: "Ambros will bring us the efficiency associated with Henkel, and we expect Gruen to tighten up the accounting," says Baronius, who regrets that the new management's takeover is only now taking place.

The future of Chemie AG can only be assured, however, if the company, which still belongs to the Trust Agency, is broken up when sold off. Supervisory board chairman Harries already has "three or four interested buyers." Although there are no buyers in sight for the dye and intermediate products sections, Harries remains confident.

The Bitterfeld problem has eased, however: The air has greatly improved, and one can now take deep breaths on the road linking Bitterfeld and Wolfen, ironically nicknamed by locals "the road of 1,000 scents." Land representative Thiel is proud of the network of monitoring stations set up on his initiative in the Bitterfeld district with the help of around 120,000 inhabitants. He points out that "we regularly achieve readings showing pollutant levels below the maximum permissible levels." Yet there still remains the task of ground reclamation, where only gradual progress is possible according to Thiel. Though a start has been made with a new community sewage works costing DM300 million, it will take years—and cost billions—to make the region once again fit for people. Still, Thiel remains convinced: "We'll do it. After all, we've made a start."

Germany: Non-University R&D To Be Increased In Ex-GDR

92MI0063 Stuttgart *LASER UND OPTOELEKTRONIK* in German Oct 91 p 13

[Text] The Science Council has undertaken a task of national importance in assessing the entire non-university research scene in the laender of the former GDR, a feat without precedent in German history. The major part of this work, which covers the former Academy of Science (AdW) in particular, was concluded with the 5 July 1991 recommendations. The Science Council recommended that more than 40 new research facilities be created. It based its recommendations primarily on the following objectives:

- to enhance the quality and self-determination of science;
- to maintain good research potential;
- to create a balanced relationship between university, non-university, and industrial research;
- to foster scientific competition.

A range of research facilities incomparable with anything in the original Federal Republic will emerge in the new laender. New impetus for research in Germany as a whole will come from, for example, a planned environment research center in the Saxony/Saxony-Anhalt area, a bio-medical research center in Berlin-Buch, and continental lithosphere research institute in Potsdam—all three are to be major research establishments, and also

from the new Max Planck Society (MPG) and the Fraunhofer Society (FhG) facilities.

The first steps towards implementing the recommendations announced by the Science Council in January and March 91 have already been taken.

Examples:

- The foundation committee for the new biomedical research center in Berlin-Buch has already drawn up outline plans;
- The Institute of High-Energy physics in Zeuthen is being annexed to the DESY [German Electron Synchrotron] major research establishment;
- The Institute of Cosmic Research in Berlin is being annexed to the German Aerospace Research Institute (DLR);
- The MPG has founded 16 teams in the new laender and Berlin;
- The FhG has already decided on 19 facilities.

Of the current AdW staff of approximately 18,000, the BMFT [Federal Ministry of Research and Technology] calculates that in all probability, about 11,000 will be able to continue in employment, an entirely respectable result that would have seemed impossible a matter of months ago. It is probable that 6,400 employees falling within the terms of reference of the BMFT will be funded jointly by the Federal Government and the laender. In addition, approximately 1,600 will be integrated into higher education under the university regeneration programme. It is expected that almost 300 will be absorbed into federal ministry research facilities, and over 400 into land-level research centers. Finally, job creation measures are planned for about 2,500 employees. As far as can be seen at the moment, the aim of "good and equal research conditions in the whole of Germany" will be achieved. When the restructuring has been completed, research in Germany will be more varied and more productive than ever before.

New German States Offered Electronic Management Assistance

92WS0122A Berlin *RECHENTECHNIK-DATENVERARBEITUNG* in German Oct 91 pp 7-9

[Article by Dr. Holger Martin, WEMEX Computer, Berlin: "Electronic Management Assistance for the New German Laender"]

[Text] The establishment of effective administrative structures in the new German laender is essential to the construction of the sort of infrastructure necessary to improve the economy and bring the living conditions in eastern Germany up to the level of those in western Germany.

Any delay in the establishment of these administrative structures will have a direct effect on the rate of economic and social development in the towns and communities.

It is in this light that we should view the introduction of modern information and communications technology into government functions.

There is no question that the use of modern information processing and communications technology significantly increases municipal administrative efficiency. Nonetheless, many communities are nearly buried by the electronic avalanche, i.e., management assistance.

Some of the common problems affecting the equipment of municipal offices with modern technology include erroneous administrative concepts, overly profit-oriented and untrustworthy sales personnel, blind faith in marketed solutions, and a pronounced push-button mentality on the part of administrative personnel who lack the corresponding training.

Over the past few months, WEMEX Computers, an East Berlin-based computer retailer, has succeeded in collecting a considerable amount of enlightening information. Their findings are summarized in the following article.

Better Use of Modern Technology

Over the past several months the WEMEX Computer Info-Mobile presented a road show. Under its motto "Brandenburgers Do It Better," the tour covered many Brandenburg cities and communities (See the RECHEN-TECHNIK-DATENVERARBEITUNG article, Issue 6/91). "Solutions and ideas" were marketed directly to the customer: municipal administrations. During the tour, WEMEX Computer succeeded in demonstrating its competence to over 50 government offices. The firm plans to expand on the generally favorable reaction to the tour by beginning another one this fall.

In addition to improving public relations and generating commercial successes, this contact with nearly all the major Brandenburg municipal and other public administrations also led to a number of interesting findings. These included information on general developmental problems related to the establishment of new administrative structures, information on the extent to which communities are supplied and equipped with electronic management aids, and information on the consultation and sales practices of other firms. The following experiences, problems, and contradictions in particular appear to be of general interest:

- Personal computers and a number of other modern office communication equipment are now routinely used in most municipal administrations of the new German laender. This is not overly surprising, as the use of information technology did not "come out of nowhere." By no means, however, are all the options offered by modern technology being exploited. The

concept of a closed, systems-supported information processing system which would network together municipal offices can, understandably, not be introduced overnight. Even in the administrations of the "old laender," this is far from being a standard part of administrative rationalization.

Practical experience shows that, as a result, modern technology is gradually being adopted for traditional tasks such as financial affairs, budgetary, cash accounting, and internal auditing (HKR) procedures, personnel management, population registration; social affairs; and automobile registration.

This approach, dictated by the demands and pressures of daily tasks, is understandable, but not unproblematic.

The time constraints under which information systems are commonly installed today must not lead to short-sighted solutions which ignore from the outset prospective developmental requirements.

- In general, municipal administrative management personnel demonstrate a remarkable openness towards the systems support of their present and future tasks as well as a distinct awareness of the problems involved in this support. Nonetheless, the conceptional, organizational, and personnel requirements have not been sufficiently met. All too often, hardware and software is purchased hastily and without thought. This frequently conceals a superficial technological orientation which does not take into account the numerous and complex problems associated with the introduction of this technology.

Obviously, many communities underestimate the difficulties involved in the introduction of modern information technology, as the extent of these difficulties is not immediately evident to everyone. Conversations repeatedly made it clear that the responsible administrative officials are uncertain and that, in extreme cases, they actually cause funds to be spent unwisely. The ambitious plans of many communities lack the necessary solid foundation. At the very latest, this becomes apparent when the operation of the data processing system must be financed. The cost of procuring the hardware and software accounts for approximately 30 percent of the total outlay. The remaining 70 percent goes towards organizational, personnel, and other requirements.

- The situation in rural communities is particularly problematic. These communities lack the technical expertise necessary to evaluate the data processing packages on the market. Not only must they become competent themselves, but they are also much more dependent on external expertise and advice. It is these smaller communities that are frequently cheated in business transactions. They are either sold hardware that far exceeds their needs and is therefore too expensive, or they are sold data processing systems that are too limited, forcing them sooner or later to make additional purchases.

Municipal government means that the communities themselves must achieve the rationalization of their administrative functions. For external support can only be provided to the extent that administrative personnel acquire a corresponding degree of technical knowledge.

- Another unpleasant discovery is that partner communities in the old German laender have "recommended" to the eastern communities the hardware and software configurations that they use in their own administration. By doing so, officials on temporary loan from the old German laender frequently ensure western firms of business contacts which extend their marketing range.
- The variety and frequent incompatibility of the hardware and software packages on the market will lead to significant problems in the establishment of standardized communications structures within the new German laender. These problems will be aggravated by uncertainties regarding territorial classifications and the merging of several districts in the course of the proposed district administration reform.

Technical Advice Is Vital

The situation as pictured above clearly demonstrates both the necessity and the urgency of professional consultation support for public administrations that are in the process of establishing a systems supported information system.

Consequently, WEMEX Computer expects that it will, in close cooperation with various associations and institutions (such as the Municipal Association for the Simplification of Administration (KGSt), the Association of Office Communication Users, and the Association for the Promotion of Public Data Processing) continue to have a great deal of responsibility to the municipal administrations of the new German laender.

It was inevitable that cooperation with prominent associations and institutions would lead WEMEX to base its consulting and marketing procedures on tried and true recommendations by these institutions, i.e., recommendations resulting from long-term employment of information and communications technology by the municipal administrations of the old laender. The recommendations and decision-making criteria provided by the KGSt are of particular value where municipal administration and the consultation procedures of data processing firms are concerned.

The KGSt document clearly describes the difficulties involved in basing municipal administrative procedures on information technology. It is divided into four sections, which address current questions and problems relating to the introduction of data processing:

- 1. Key administrative policy questions;
- 2. Decision-making criteria;
- 3. Advice for dealing with external consultants;

4. Transitional problems, using population registration as an example.

Reflecting the WEMEX findings, the KGSt observes with concern "that eastern German municipalities have been and will continue to be flooded with advertisements for information technology. Such advertisements are concerned solely with the sale of hardware and systems-oriented software, and do not take into account general requirements or administrative policy guidelines. There is also concern "that communities will waste their limited resources on an information system which will then lie around gathering dust." This phenomenon, well-known from decades of economic irrationality in the German Democratic Republic, must not be allowed to plague us again.

Anyone offering his services to the municipal administrations must be committed to working diligently to prevent this from occurring. In the end, however, it is the responsibility of the self-administrating communities to distinguish the wolves from the sheep in the data processing market.

Erfurt Begins Building Data Processing Infrastructure

92WS0122B Berlin RECHENTECHNIK-DATENVERARBEITUNG in German Oct 91 pp 11-14

[Article by Dr. Gerald Hartung, Department Chief of the Erfurt Municipal Data Processing Department]

[Text] The rapid establishment of a legal and workable administration in the five new German laender is one of our most urgent political tasks. With the exception of interim arrangements, this administration will be based primarily on the laws of the "old" Federal Republic of Germany. Consequently, western German administrative procedures and applications can be adapted for relevant administrative tasks such as financial affairs, personnel management, population registration, social services, real estate, etc., and used in synergy with an information technology infrastructure which is to be constructed. Due to the remarkable rate of innovation in the field of information technology, an autonomous, decentralized hardware and software base is already attainable. Consequently, the principle of municipal government becomes more important, inasmuch as information is collected, processed, and stored within the municipal administration itself, eliminating—depending on the data—the necessity of being dependent yet again on the central administration.

Figure 1. Municipally Relevant Administrative Tasks

- Municipal Affairs:
 - Municipal Budgetary, Cash Accounting, and Internal Auditing (HKR) Procedures
 - Personnel Management (Accounting, Staff Planning, etc.)
 - Population Registration

- Social Services
- Real Estate Management
- Maintenance of the (digital) municipal planning map, with extensive nonpersonal data references (economic, sociological, ecological, and demographic data, for example) for strategic planning tasks and for responding to current challenges
- Office Automation (Word Processing, Electronic Mail, Municipal Conferences, Individual Office-Specific Data Processing Tasks)

Figure 2. Premises for the Construction of an Information Technology Infrastructure

- Establishment of Autonomous, Independent Computer Systems as:
 - Data Processing Resource for Municipal Procedures
 - Storage Resource for Relevant Data Pools
- Increased Installation of Multifunctional Workstations (PC's Rather than Terminals) for
 - Access to Municipal Procedures/Data
 - Office Automation Tasks
 - Individual Branch-Office-Specific Tasks
- Gradual Networking of the Computer Systems in Order to Create an Administrative Information System

Figure 3. Evaluation Criteria for Bid Invitation Documents

- General Qualifications
 - Completeness of Specifications
 - Terms of Financing
 - Terms of Delivery
- Price/Performance Evaluation
 - Performance Evaluation of Office Computers
 - Cost Analysis of Office Computers
 - Cost Analysis of Personal Computer Systems
- Other Evaluation Criteria
 - Company Status
 - Expertise in the Municipal Sector
 - Reference Installations
 - On-Site Service (Municipal Competence and Technical Support)
 - Successful Bidding for Standing Orders
 - Application Integration Capability
 - Graphics Know-How

Figure 4. Installed DPS and DPX Computer Systems and Their Performance Parameters

- DPS 6000 Computer System, Model 422
 - Main Memory.....16 MByte

Computing Speedca. 1.8 MIPS
 Disk Capacity.....4.8 GByte
 High Speed Printer1200 lines per minute
 Magnetic Tape Device6250/1600 bpi
 Streaming Tape1.3 GByte
 On-Line Data TerminalsPresently 30 (164 max)
 Operating System ...GCOS 6 HVS plus assorted tools

- DPS 6000 Computer System, Model 221

Main Memory.....4 MByte
 Computing Speedca. 1.0 MIPS
 Disk Capacity650 MByte
 Streaming Tape150 MByte
 On-line Data Terminals.....Presently 3 (48 max)
 Operating System.GCOS 6 HVS Plus Assorted Tools

- DPX/2 Computer System, Model 360

Main Memory.....80 MByte
 Computing Speedca. 34 MIPS
 Disk Capacity4.0 GBytes
 Streaming Tape2.3 GByte
 On-line Data Terminals.....ca. 15 (256 max)
 Operating System ..B.O.S. (UNIX i.a.w. XPG-3) Plus Assorted Tools, C-Development System, and INFORMIX Database

Initial Situation

September 1990 is considered the starting point for the organization of an information technology infrastructure. At that point it was fairly clear that municipal procedures that had previously been centrally organized (storage of residential and housing data, personnel accounting, etc.) were to be discontinued in accordance with the Unification Treaty and the accompanying legal provisos. Access to powerful AT personal computer (PC) systems and their applications software meant that the - admittedly first - steps taken thus far towards office automation (PC1715, AC7100) could be abandoned.

In the first conceptional stages:

- Municipal administrative tasks were discussed, data processing support of which is essential both for the proper structural and functional organization (internal operation) and for the training of the civil service personnel (external operation) (Figure 1).
- Premises of an autonomous information technology infrastructure were formulated (Figure 2).

This concept is to be implemented in stages. The solutions are to be oriented on international standards and norms (UNIX-orientation in accordance with the XPG-3 Standard, International Organization for Standardization-Open Systems Interconnect (ISO-OSI) Reference Model for networking computer systems). However, proprietary systems platforms will be used as temporary solutions.

Via quantification of the requirements for the municipal procedures soon to be installed on a priority basis (financial affairs, personnel management, population

registration, and office automation), an iterative process was used to determine performance parameters for each procedure. These parameters were then used as a basis for the mandatory bid invitation documents.

Following the ensuing restricted bidding, in which nine renowned firms took part, the contract was awarded to the Bull AG municipal package. This decision was made after an extensive evaluation, based on standardized evaluation criteria (Figure 3) and an in-house assessment by municipal users of the limited selection of application packages. The decision was announced via a resolution by the municipal and local council.

The rapid procurement of a rental system, complete with the necessary training support, made it possible to initiate budgetary, cash accounting, and internal auditing procedures (HKR) by the beginning of 1991. Due to the commitment of all involved personnel and to their recognition that the data processing procedure reflects the new legal foundation, and must therefore be incorporated into the training process at the workplace, there was little evidence of the resistance normally encountered when a new technology is introduced. Consequently, it was also possible to install a personnel accounting system for approximately 7,500 employees within a relatively short period of time and see the first benefits of office automation. At the same time, the hardware and software base was expanded, local and remote terminals were installed and cabled, the autonomous use of PC's was accelerated, and employee training was mandated.

Current Situation (8/91)

Municipal Procedures on Office Computers

Two computer systems are presently installed on Municipal Data Processing Department office computers (Figure 4). The more powerful system is used daily in the on-line mode for HKR and personnel management procedures, and has the following range of functions:

HKR:

- The 1991 budget was written.
- Budgetary control and machine processing of internal auditing procedures were initiated.
- Since 1 June 1991, daily records have been maintained of cash transactions and budgetary control procedures.
- A machine-readable data medium exchange has been organized with banks and other financial organizations.
- Approximately 18,000 tax accounts are kept up to date.
- The work of the auditing office is supported.

Personnel Management:

- During the data acquisition phase in May and June, the personnel records of approximately 7,500 municipal administrative employees were entered using the on-line mode.
- Pay and benefits accounting in accordance with the eastern German statutory salary scale (BAT) has been carried out since June 1991.
- Absenteeism is recorded.

Instant access to the individual procedures is provided to the corresponding branch offices (municipal cash reserve office, budget office, municipal tax office, personnel office, auditing office) via approximately 30 data terminal sets (terminal, PC, and printer).

By the end of 1991, the number of data terminal sets for this computer system will be expanded to approximately 100 in order to make the above-mentioned procedures available to more users. This will also allow the following applications, currently in the preparatory phase, to be implemented:

- Population registration, including statistical analyses and evaluations;
- On-site fines for traffic violations.

The second dedicated computer system is external, and is used strictly for transaction-oriented processing of welfare procedures in accordance with the Federal Welfare Law (BSHG). In the preparatory stage, the system will be with approximately 30 data terminal sets (three are in use in the current testing and trial phase) and linked with the above-mentioned system via OSI services (File Transfer (FTAM), remote log-in).

In addition, by state decision, support was provided for the March 1991 installation of two Hewlett-Packard computer systems in the Erfurt vehicle registration office for use in licensing procedures. No further reference will be made here to these systems.

The Integration of UNIX-Based Procedures

While this was taking place in the commercial sector, the first UNIX-based procedures were being implemented in the scientific/technological sector. For example, a DPX/2 computer system (Figure 4) was installed and is presently being utilized for a construction permit procedure. The system is also to be used as an information storage resource for the geographical database and relevant nonpersonal data and as a communications resource for an administrative information system which will be gradually set up.

A computer-aided-design (CAD) workstation (SICAD-DIGSY) is in use in the Land Surveying Office for digitalizing the municipal planning map. Other, less extensive, UNIX systems are used for specific applications in the Civil Engineering Office and in the Office for the Resolution of Land Ownership Disputes. Figure 5 provides an overall picture of the procedures carried out on the DPS and DPX computer systems.

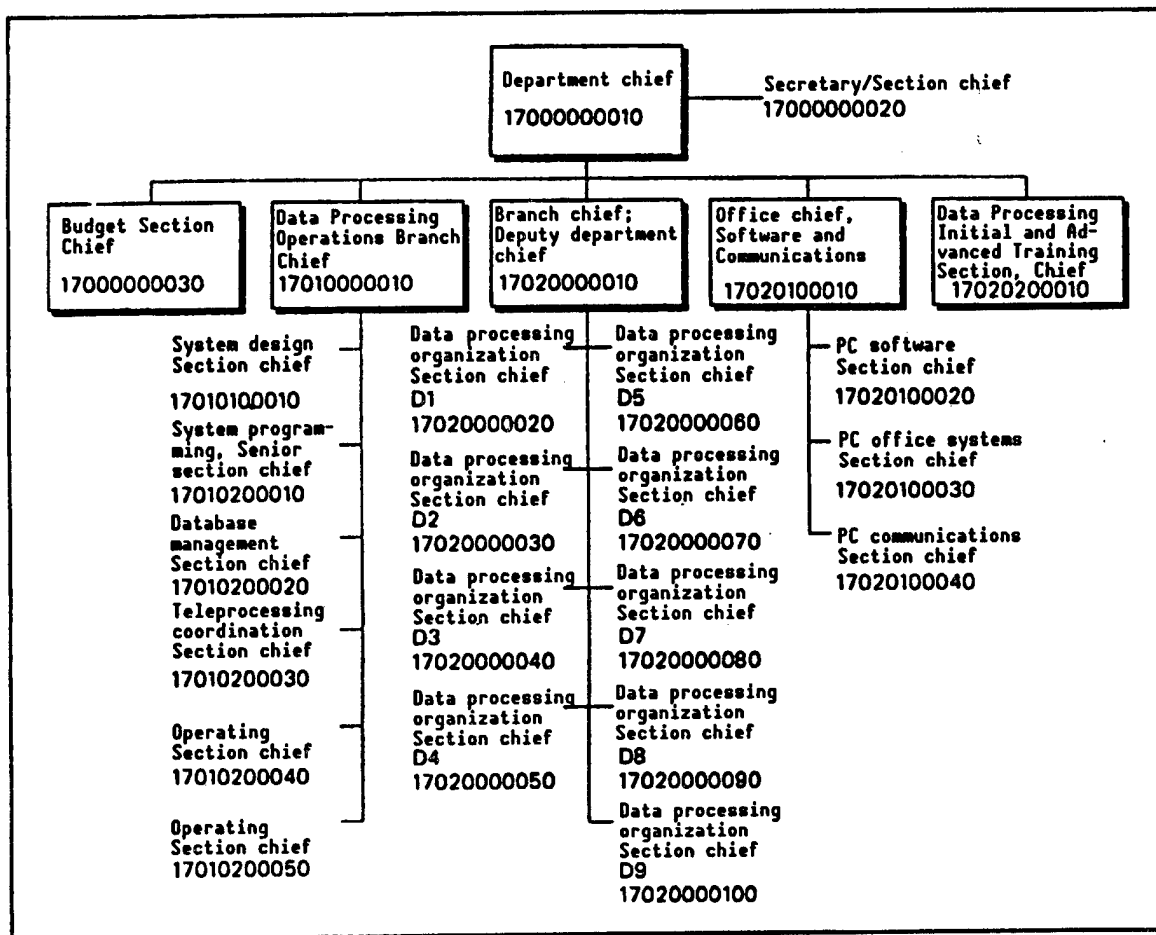


Figure 5

Office Automation and Individual Applications

Figure 6 shows the PC hardware used in the municipal branch offices and departments. The individual configuration was matched to the required spectrum of applications, based on the areas of responsibility.

All PC's are equipped with the following basic package:

- MS-DOS 3.3 Plus (operating system);
- Windows 3.0 (man-machine interface);
- MS-WORD 5.0 (word processing).

Depending on the requirements of the branch offices, the following have been installed for use by selected individuals:

- dBASE IV (database);
- MS-EXCEL (spreadsheet).

Specific applications such as IDEALOG, KAVDI, and others have also been installed in selected branch offices.

Training

Employees of the Municipal Data Processing Department were trained on the GCOS-6-HVS operating system as well as on the use of certain relevant tools. The training took place both in Erfurt and at the Bull Training Center.

Service personnel were also required to attend classes on the applications software used for HKR and personnel management. Systems-supported training programs were conducted in Erfurt for branch office section chiefs.

Within the framework of administrative aid, competent employees from selected communities in the old German laender that use comparable applications were consulted on special tasks. This helped round out the training program. The same procedure will be followed for applications installed in the future.

Lectures on PC fundamentals are given in-house by Erfurt administrative personnel. User acceptance has been very high. So far, the pace of basic instruction (MS-DOS, WINDOWS, WORD) has been successfully

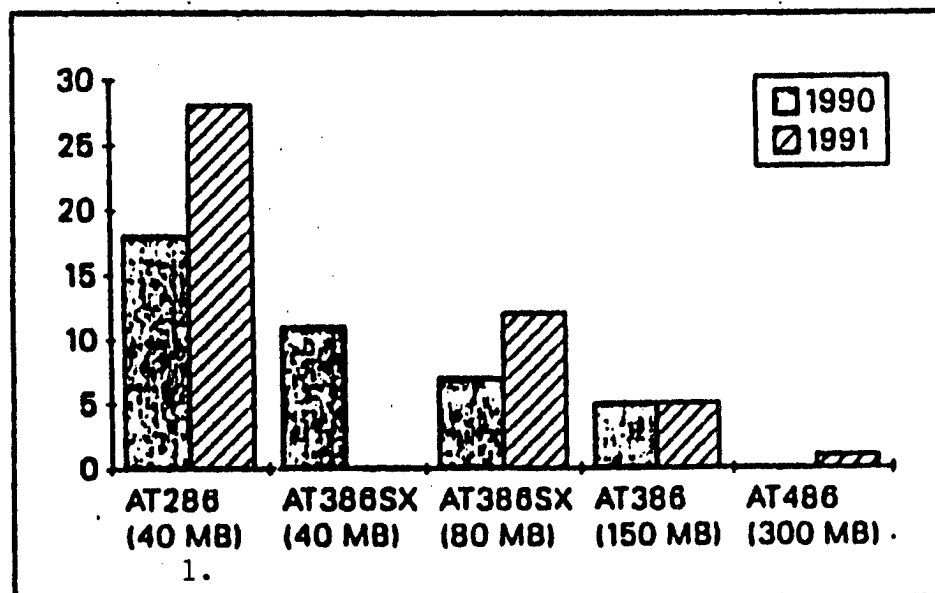


Figure 6: Quantitative overview of installed hardware

Key: 1. Megabyte (MByte)

matched to that of the installation of hardware. Instruction on dBASE IV and EXCEL was provided in part by outside lecturers.

It is also worth mentioning that Bull AG, in connection with the upcoming Erfurt 1250-year anniversary, is equipping a computer package (DPX/2 and several diskless PC's, including networking) for the advanced training of municipal personnel. Training on this system, first in MS-DOS, later in UNIX, is to begin in the 91/9c2 fall semester.

The Municipal Data Processing Department

The Municipal Data Processing Department is subordinate to the Central Administration Department, and considers itself the service section for all municipal departments and branch offices.

The duties of the Municipal Data Processing Department, given above for the individual sections and in connection with the branch offices, are as follows:

- 1. The research, planning, and installation of data processing packages for efficient municipal government;
- 2. The development of autonomous municipal data processing applications in dialog and batch mode;
- 3. The creation, operation, maintenance, and security of data pools or data banks;
- 4. The coordination of the data communication services, both in-house and with external institutions;
- 5. The coordination of PC use, procurement of standard application software, and support for the integration of branch office-specific applications;

- 6. The implementation/coordination of in-house municipal training programs;
- 7. The development of guidelines (official instructions) for the organization of data processing and data protection measures.

In order to effectively implement these roughly-formulated duties, the department is divided into three sections:

- The *Data Processing Operation* section, responsible for the control of batch and dialog operations on the central office computers;
- The *Data Processing Organization, Data Processing Programming, and User Service* section, responsible for matching user groups in the departments and branch offices to municipal procedures;
- The *PC-Software and Communication* section, responsible for managing and supporting PC users and their applications.

Figure 7 shows the overall structure of the department. It should be noted that the positions indicated are only approximately 50 percent filled.

Outlook

Thus far, the results of the "downsizing-oriented" concept for establishing the information technology infrastructure justify its continuation. In the future, the integration of a Client-Server Architecture will dominate this procedure. This is the only way to achieve a user-transparent distribution of data and applications on the municipal-wide networked computer system and create an administrative information system.

In addition to the continued use of PC's and workstations, administrative procedures will be oriented on

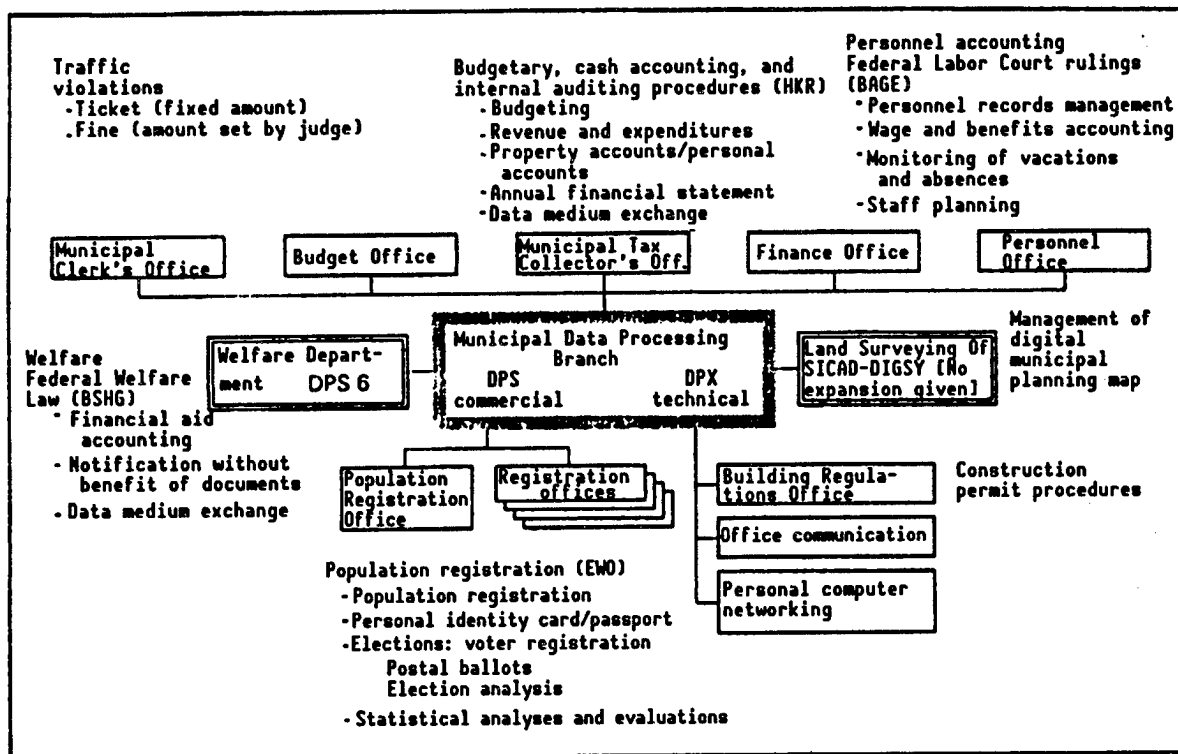


Figure 7

UNIX-based systems, as, in the long run, the characteristics of this systems architecture promise the investment security which is essential for municipal use. These characteristics include:

- High locally accessible memory and processing capacities;
- Optimal networking and communications options (Transmissions Control Protocol/Internetwork Protocol (TCP/IP), local area network (LAN) and wide area network (WAN) integration, integrated OSI services and protocols);
- A wide range of software options (from standard word processing, presentation graphics, and data bank applications to communications products such as X-400 to CAD graphics applications).

Billions Earmarked for Bolstering Electronic Data Processing in Former East Sector

92WS0122C Berlin RECHENTECHNIK-DATENVERARBEITUNG in German Oct 91 p 31

[Article by "rd-FL": "Four Billion German Marks Earmarked for Electronic Data Processing in Eastern Germany"]

[Text] Any firm that wants to take part in the reconstruction of the new German laender should focus on the

establishment of city management systems and new business establishments. Based on extrapolated company releases, Dr. Ruepprich estimates that, over the past 12 months, approximately 4 billion German marks [DM] has been invested in data processing in the new German laender as opposed to DM60 billion in the old German laender. This proportion does not reflect the distribution of population, and serves to re-emphasize the weakness of the eastern German economy. The DM4 billion is being spent primarily for the replacement of hardware, and, to a lesser extent, on off-line standard software and on data processing consultation.

We have recently seen the first hesitant demand for dedicated software. This market is difficult to predict, however, as many firms still have considerable projection capacity and are being offered good deals on software packages by well-known major computer firms. Furthermore, discount and mail-order firms have also staked out their share of the market. SFI itself is a mid-sized firm.

Future of Berlin's Central Institute for Electrophysics Discussed

92WS0148B Duesseldorf VDI NACHRICHTEN in German 18 Oct 91 p 25

[Article by Delano L. Klipstein: "Central Institute for Electrophysics Facing Hard Times"]

[Text] The Central Institute for Electrophysics in Berlin is now experiencing a dramatic contraction phase just like many other scientific institutes in eastern Germany. Area director Professor Dr. Gerd O. Muller said, in a conversation with the VDI NACHRICHTEN, "We are now among the world leaders with the work on the electroluminescent display. The Japanese have focused on the LCD [liquid crystal display]. It is very satisfying to us that in recent times we have given one-half of all main lectures presented at international conferences. We were thus able to prove our good position."

There is the danger that, in the future, the following scenario is not too far from the truth. The institute has already contracted to date and should be halved once again. There is little hope that the budget of the BMFT (Federal Ministry for Research and Technology) can provide additional monies for a very promising field. Prof. Muller calculates where the chances for a HDTV EL display could be. "If we get the RGB [red green blue] colors by subtraction from white, we can build flat panel screens at half the price of other technologies. This is because of the significantly lower costs in display manufacturing."

The Institute supplied displays with a picture diagonal of 5 inches in the eighties as samples for the former GDR electronics industry. They were not used in series production. Of course, the Institute losing its good position in the international competition concerns Muller. "With only 30 percent of the original team, we cannot provide results at the same rate as before."

In saying this, he has a few other ideas that would be quicker to realize than the large flat HDTV screen. "Say you use the light emitted from the edges of such a sequence of layers of II-VI material as a 'light ruler.' Then this ruler can, for example, provide an exposure line for a high-performance printer having very high resolution." To show that it can happen, he performs the experiment at once. The line of light is so fine and so bright that it could easily be used in a printer having 1000 dpi [dots per inch]. This would cause the hearts of the developers of desktop publishing printers to leap with joy. This would finally be the resolution with which desktop systems could replace professional exposure equipment.

When does he expect a color EL screen—even if it is not immediately HDTV-ready? "That will depend on the shades of gray needed. If we first use 16 shades of gray as a basis, this will be completely adequate for industrial applications. If this is so, that point will be about the midnineties," says Professor Muller. This length of time does not appear too long. This is especially true when you consider that about 20 years passed between the first LC displays of RCA and the first color miniature televisions using this technology.

Germany: Disbanded Robotron Company Attracts Investors

92MI0058 Duesseldorf *HANDELSBLATT* in German 25-26 Oct 91 p 22

[Text] The fact that the manufacture of data processing equipment at Robotron Office Machinery Works (BWS) in Soemmerda will cease completely at the end of 1991 also means a fresh start for other activities at this east German industrial site, said board chairman Rudolf Blum at the "Systems" trade fair. New industries will locate there.

Blum explained that the restructuring and rehabilitation measures agreed with the Trust Agency and already introduced were beginning to bite in the little town of Soemmerda, population 21,000. To date, 22 contracts had been concluded with firms in a wide variety of sectors wanting to invest in Soemmerda. However, they still had to be approved by the Supervisory Board of BWS, which owns the site.

About a quarter of the investors were from abroad, including a far-eastern manufacturer in the DP [data processing] sector. These 22 enterprises would create around 1,500 jobs by the end of 1991. Former Robotron employees were also setting up in Soemmerda in the form of a management buy-out. Blum said that there was a lot of interest in the site and he expects new investors to be attracted as a result of talks held at "Systems." For example, BWS was on the point of signing a contract with an American and Canadian firm.

The BWS board's aim was to have 2,000 jobs at Soemmerda by the end of 1992. This number is, however, modest compared to the 13,000 employed by Robotron the former GDR's onetime technological showpiece. At the end of this year, only 300 of the 900 still employed there by Robotron will remain to wind up the firm's DP division. This year, sales of BWS printers and personal computers will reach 160 million German marks, most of which were made in the first half of the year. Before unification, Robotron has sales of around 1 billion East German marks.

Max Planck Society Plans Initiatives in New German Laender

92MI0084 Bonn *WISSENSCHAFT WIRTSCHAFT POLITIK* in German 9 Oct 91 pp 5-8

[Text] In the wake of the unification of the two parts of Germany, the Max Planck Society (MPG) has sought to integrate science and research rapidly in a variety of ways. These efforts were channeled through joint programs, teams and project groups (as an initial stage), and institutes. A major concern is to implement the recommendations of the Science Council—as often as not they are implemented as soon as they are issued. For example, back in June the senate of the MPG, in anticipation of the final recommendations announced later, adopted the decision of principle to set up the first Max Planck Institute in the new laender in Halle. It would work on

solid-state physics and electron microscopy and be based on the Academy of Science institute already located there. We report below on the progress made to date on integrating the east.

The decision on Halle, the practical details of which have still to be worked out, remains subject to financing for the new institute being guaranteed. Initial planning and preliminary approval for staffing have proceeded sufficiently far under a planning committee for the Max Planck Society to anticipate rendering its decision to found the institute effective as of 1 January 1992.

Also in advance of the Science Council's announcement of its recommendations, discussions have started within the MPG with a view to setting up a Max Planck institute of colloid and interface research. Consultations over the practical details are still under way, but according to MPG President Professor Hans F. Zacher, they are "making good progress."

In addition, the Science Council has recommended that the Max Planck Society should create a series of teams and project groups in the new laender. The MPG plans to institutionalize the fusion-oriented plasma physics research facility in Berlin proposed by the Science Council as a branch of the Max Planck Institute of Plasma Physics in Garching. Agreement has been reached with the land of Berlin, and negotiations are currently proceeding on a complementary cooperation agreement with the Humboldt University in the east of the city.

The recommendation to set up a project group on plasma-astrophysics in Potsdam is also currently being examined by the MPG scientific committees concerned. In parallel with these discussions, however, the land of Brandenburg is discussing its own ideas on the institutional restructuring of the Central Institute of Astrophysics, and they may not be along the same lines. As recommended by the Science Council, the MPG is to take over the Rostock department of "complex catalysis," hitherto a branch of the Berlin Central Institute of Organic Chemistry, as either a team or project group. This is also being discussed by the relevant committees of the Max Planck Society, which are likely to propose to the senate that the department be attached to the University of Rostock as a fixed-term team and subsequently transferred completely to the university.

Most of the Science Council's remaining recommendations on setting up MPG teams had responded to previous initiatives by the Max Planck Society. The remainder are, firstly, recommendations for two cosmos research teams, which the society considers itself unable to set up, both because the scientific head that it had in mind is no longer available, and because the discipline concerned falls outside the MPG concept; secondly, a recommendation on mathematics is currently under consideration by the committees, although two are the most likely to be set up, owing to limited resources.

The Science Council's request to draw up a scientific concept for a future Albert Einstein Institute of Gravitational Wave Physics will also be met by the Max Planck Society, as will the recommendation that: "The MPG should take over patronage and overall responsibility for seven humanities research centers."

In order to guarantee continuing employment for the researchers recruited to work in these humanities centers the Max Planck Society will later this year set up a subsidiary as a "limited liability administrative company for new academic ventures" with responsibility for these researchers. It has already initiated discussions concerning the future structures and development potential of the seven areas concerned: contemporary history, history and theory of science, European enlightenment studies, modern oriental studies, general linguistics, literary research, and the culture and history of eastern central Europe. The MPG has thus fulfilled the undertaking it gave at the start of the unification process to comply with the recommendations of the Science Council and make every effort to examine how far it is able to implement them.

MPG Teams for the New Laender Decided to Date

Humboldt University, Berlin:

- Structural grammar (Head: Professor Manfred Bierwisch)
- Nonconventional radiation (Head: Professor Harry Paul)
- Transformation processes in the new federal laender (Head: Dr. Helmut Wiesenthal)
- Theory of miniturized semiconductors (Head: Dr. Roland Zimmermann)

University of Halle-Wittenberg:

- Enzymology of peptide bonds (Head: Dr. Gunter S. Fischer)
- Environmental law (Head: Professor Reinhard Mueller)
- Synthesis, structure, and properties of liquid crystal systems (Head: not yet announced)

Friedrich Schiller University, Jena:

- Regulation of DNA replication in bacillus subtilis (Head: Professor Detlev Behnke)
- CO₂ chemistry (Head: Dr. Eckart Dinjus)
- Physics and chemistry of interstellar dust (Head: Dr. Thomas Henning)
- Gravitation theory

Medical Academy, Erfurt:

- Molecular and cellular physiology (Head: Professor Bernd Nilius)

University of Rostock:

- Theory of multiparticle systems (Head: Professor Gerd Ropke)

Technical University of Dresden:

- Mechanics of heterogeneous solids (Head: Professor Wolfgang Pompe)

Land of Brandenburg University Potsdam:

- Estate administration east of the Elbe as social history (Head: Professor Jan Peters)
- Quantum chemistry possibly located at the Humboldt University, Berlin (Head: Dr. Joachim Sauer)

Germany: Academy of Sciences Restructuring To Create 35 Institutes

92WS0064A Duesseldorf VDI NACHRICHTEN
in German 4 Oct 91 p 6

[Article by Richard Sietmann: "Science Park on the Spree; 'Blue-List Institutes' Dominate Research Landscape"; first paragraph is VDI NACHRICHTEN introduction]

[Text] Berlin, VDI-N—More than half of the research potential of the GDR Academy of Sciences was located in Berlin. Short on funds, the city is beginning to implement the Science Council's recommendations with regard to restructuring. The plan is there, but definitive funding has not yet been obtained.

Of the total of 64 institutes of the former GDR Academy of Sciences, 35 were located in Berlin; 12,000 of the at one time 24,000 people employed by them used to work in the city. As established in the unification treaty, these institutes will be terminated by the end of the year and those research areas and research teams worth retaining in accordance with the recommendations of the Science Council will be transferred to the research organizations of the West German science landscape.

Moreover, the Berlin Senate has largely followed the Science Council recommendations. The result is a recently created science park distributed over the entire municipal area. With the Center for Molecular Medicine in Berlin-Buch, a new major research institution will be created. Added to it will be two outstations of existing major research institutions in the West: the Research Center for the Search for Remote Planets of the DLR [German Aerospace Research Institute] in Berlin-Adlershof and the Fusion-Oriented Plasma Physics Outstation of the Max-Planck Institute for Plasma Physics in Garching. Funding for these institutions corresponds to the customary ratio: 90 percent covered by federal funding and 10 percent by state funding.

The value placed on the efficiency of major research institutions by the Science Council is, however, also reflected in the Senate's view of the matter. The primary emphasis of the restructuring lies on nine new institutes on the so-called "Blue List" that are to be founded. They will involve smaller joint federal and state scientific institutions whose research areas will approximately range from those of the Institute for Petroleum Research

in Clausthal-Zellerfeld to those of the Heinrich-Hertz Institute for Communications Technology in Berlin. There were a total of 47 Blue-List Institutes (BLI) in the old federal states. Following a thorough evaluation, the Science Council had recommended the establishment of a total of 35 additional institutes out of the legacy of the GDR Academy.

Usually, the federal government and the resident state each bear half of the basic funding of the BLI's. The "Blue List," however, also comprises scientific service institutions, like perhaps the Society for Information and Documentation (GID) in Frankfurt or the Institute for Scientific Films (IWF) in Goettingen, which are encouraged by the federal government and all of the federal states because of their interregional studies, for which the federal government on occasion assumes a larger share of responsibility.

The new Technical School for Crystal Cultivation, formerly a subdivision of the GDR Academy's Center for the Construction of Scientific Instruments, will represent this kind of service institution in Berlin. Its mission will consist of basic and applied research on the cultivation and characterization of crystalline raw materials. The available know-how for the development of methods and plant facilities in the field of III/V semiconductor compounds like gallium arsenide and indium phosphide, important substrate materials for optical electronics, will thus be preserved. The technical school in Adlershof should quickly and flexibly fill orders for the manufacture of these materials in close cooperation with industrial partners. The field of electronics will be considerably strengthened, as is appropriate in view of its importance. A BLI for semiconductor physics will conduct basic research in the field of III/V compounds and other promising semiconductor materials—particularly techniques for the production of molecular beam epitaxis, transport processes in microstructures, and theoretical research on the nonlinear effects and electronic properties of low-dimensional systems.

Another BLI for optical electronics and high-frequency communications technology should build a bridge to systems: technological FuE studies for the production of structural components and their integration into compact switching circuits for mobile communications systems and satellite radio technology, the goals of which are optical communications and transmission technology as well as intelligent sensor systems.

In addition and by way of example, the new Berlin entries on the Blue List include institutions for nonlinear physics and short-term spectroscopy, molecular pharmacology, and zoo and wild animal research. About half of the annual needs in appropriations of 109.4 million German marks [DM] will come from the local state economy—also 50-50 funding. Berlin Science Senator Manfred Erhardt is certain that the federal government's share will, however, "in practice be beefed up with funds from the University Renewal Program (HEP) at about 25 percent in favor of the local state." Erhardt sees in

this "long-term structural aid" from the BMFT [Federal Ministry of Research and Technology].

Nevertheless, the Berlin science senator was somewhat premature with this statement since they have not gotten that far yet. So far, the BMFT has only declared itself prepared to bail out the new states temporarily for 1992 and 1993 with DM60 million at any given time from the University Renewal Program. This is a fixed amount, not a commitment—not even temporarily—to assume responsibility for any higher determined percentage of the basic funding. First of all, it is obvious that DM60 million will not be enough to lower the states' shares to 25 percent—according to rough estimates, nearly DM100 million more a year would be required to do that.

Whether HEP funds can be added for this purpose is "now being investigated," we learned from the BMFT. "The BMFT goes into this investigation with good will," they said, "We'll have to see where we get the money from." Critical voices raised in the ministry are, however, of the opinion that the Science Council somewhat overtaxed the instrument of the BLI in the academy's evaluation. Originally, the BMFT did not even want to participate in the new institute-corporations as a partner and would have preferred to fund them only through appropriations.

This is not now under consideration, although in the ministry, now as before, participation is feared since "nothing but isolated institutions are sitting around in that part of the country which have no structural coordination, nor any with regard to content and are all really state institutions," as a ministry official stated. The Science Council, which has during the past few years already passed judgment on 42 of the 47 former BLI's, has clearly recognized the problem. In September it appointed a committee to determine how the "Blue List," which has been extended to include more than 80 institutions through the academy's evaluation, can be meaningfully structured.

Germany: R&D in Mecklenburg-Vorpommern Land Assessed

91MI0539 Bonn *DIE WELT* in German 21 Sep 91 p 20

[Interview with Minister Oswald Wutzke, Minister for Sciences and Arts for the land of Mecklenburg-Vorpommern.]

[Text] **DIE WELT:** What will be the role of science and research in your land?

Wutzke: Though Mecklenburg-Vorpommern was not in the past a German center for scientific work, we do possess major traditional facilities in the Universities of Rostock and Greifswald. Past research priorities in Mecklenburg-Vorpommern were concentrated particularly in the areas of engineering (ship-building), plasma

physics, chemical catalysis, atmospheric research, environmental research, and problems in selected areas of the humanities.

DIE WELT: How is research in Mecklenburg-Vorpommern now progressing, following its evaluation by the Scientific Council?

Wutzke: Mecklenburg-Vorpommern achieved above-average results in the Scientific Council's evaluation. If however we contrast the research activities remaining after the evaluation process (personnel and planned research tasks), then a substantial deficiency compared with the older laender is very apparent. If the process of adjustment in working and living conditions between the old and new laender actually is of primary importance, then the deficiencies present here must be remedied as quickly as possible, to enable us to become equally competitive.

DIE WELT: Will you then have at least enough money available to enable you to push on with research there, where this was recommended by the Scientific Council?

Wutzke: It is inconceivable that financial restraints could force us to terminate institutions which have received positive evaluation, while at the same time institutions in the older laender which have not been evaluated can enjoy unlimited financial bounty.

DIE WELT: What will be the future of the universities and colleges?

Wutzke: We will follow the Scientific Council's recommendations. They see the establishment in Mecklenburg-Vorpommern of three "blue ribbon institutes": a Max-Planck Society team, a Fraunhofer Society (FhG) team, and a subsidiary of a large-scale institute. We will also, in agreement with the Scientific Council, expand the Universities of Rostock and Greifswald into full universities and set up a technological university in Stralsund and another in Neubrandenburg.

DIE WELT: What are your plans in the area of environmental protection?

Wutzke: We will do everything in our power to put right the damage done in the past; in this connection, I would point to the environmental association at the University of Rostock. Our special priorities are Baltic Sea research at Rostock-Warnemuende (Institute for Marine Studies), and protection and study of ground water, which is a specialty of the University of Greifswald. Where environmental protection is concerned, we acknowledge with gratitude the fact that support from the federal government has made it possible for us to make a start on individual environmental projects. What we now have to do is to modify existing environmental technologies so as to tackle the special circumstances of Mecklenburg-Vorpommern.

DIE WELT: How do you see the future of science and research in the land of Mecklenburg-Vorpommern?

Wutzke: Our future task is to develop our present research potential so as to ensure our national and international competitiveness in the medium and long term. It is easy to stop research activities; it will be far harder to rebuild effective research groups. The land will do everything in its power to carry out this reconstruction. Finally, the aim of our scientific policy is to create an attractive scientific scene which will attract personalities in research and in teaching to offer our young people excellent training, so that they don't emigrate to the older laender, to avoid the eroding of our universities and to create priorities for research which will lead to an interesting range of employment opportunities. However, we're in a race against time—which we don't have.

German Research Minister Criticizes EC R&D Policy

91MI0540 Bonn *DIE WELT* in German 21 Sep 91 p 10

[Text] The Federal Government is turning its back on moves in the EC towards interventionist industrial policies. Heinz Riesenhuber, Federal Minister of Research and Technology, yesterday declared himself worried about the strong tendency to lay down industrial policy in terms of targets and methods.

In November the EC plans to launch an overall strategy for its electronics and information technology policy. The basis for discussion is a French memorandum with pronounced interventionist characteristics, involving comprehensive EC support not only for research and development, but also for marketing and production.

The French line is supported by the proposal from the Italian EC Commissioner responsible for science and research, Filippo Maria Pandolfi, for joint European semiconductor manufacture by the French Thomson company, Siemens, and Philips, with 7.5 million European currency units [ECU] in EC support. Riesenhuber asks "whether this is what the commission wants, and what industry wants." The minister doubts whether the Germans do: "For them, the loss in terms of impetus would be greater than the gain in terms of money."

Riesenhuber has sent Pandolfi a 10-point memorandum concerning EC support for information and communications technology; it includes criticism of the fragmentation of EC funding programs. He feels that programs should be targeted more on strategic priorities, and the EC should be more involved in the European JESSI [Joint European Submicron Silicon Initiative] microelectronics initiative under EUREKA [European Research Coordination Agency]. Riesenhuber demands that "flagship projects" should be undertaken even if they do not involve all EC members from the start.

The Research Minister expressly calls for a "strategy of openness," and opposes any isolationism on the part of the EC; if IBM is cooperating with European firms, that is fine by him. The memorandum calls for companies with a majority of non-European capital to be included

in EC support programs, provided that the non-European countries "abide by the rules of equal cooperation between partners." Riesenhuber states that "if American or Japanese firms carry out research and development in Europe, then we welcome them as partners."

For example, Far Eastern firms operating in Germany have to date received not a single mark from Riesenhuber's budget. It has now been announced that JESSI and Sematech, the two research initiatives by European and American chip manufacturers, have formalized their loose cooperation. The official agreement on future cooperation initially extends to two categories of projects: those with "joint activities," such as analysis of competitive chip technologies or joint acceptance testing of the production equipment for those technologies; and, secondly, "complementary activities" involving production processes, equipment and materials.

Government Science and Technology Monitoring Office Releases First Report

92WS0096A Paris *LE MONDE* in French 30 Oct 91 p 16

[Article by J-F.A.: "Science and Technology Monitoring Office' Delivers First Report on Research to Policy-Makers"]

[Text] France spends 150 billion French francs [Fr] each year on research. Some 300,000 people are employed in this field. In short, France is now oriented toward research—perhaps not yet sufficiently, but at least research has been given high priority in every budget in the last 10 years. Who finances it? What weight does it carry in Europe, in the world? What are its strong and weak points? What is its role in the flow of commerce and international trade? To answer these questions the minister for research and technology, Mr. Hubert Curien, decided in 1988 to establish a Science and Technology Monitoring Office (OST) to prepare periodic report cards on French research. In March 1990, an executive order creating this public interest group enabled the monitoring office and its 11 founding members¹ to be installed under the chairmanship of Mr. Pierre Papon, president and director general of the French Institute for Research on Exploitation of the Ocean (IFREMER).

It was not until September 1990 that the team headed by OST director Remi Barre was able to get down to work. Thirteen months later, they have published a 300-page report, "Science et Technologie indicateurs 1992" ["Science and Technology Indicators, 1992"], intended to be a French cousin of the famous Science and Engineering Indicators of the National Science Foundation. Mr. Barre explains that it is "a very sober, very objective report. People can take our figures without reservations or misgivings, without suspecting us of trying to interfere

in any way. Our indicators have to be unchallengeable, without any appearance of being 'slanted,' and thus acceptable to everyone."

The results of this "political atlas of science and technology," as Mr. Papon describes it, should help public authorities and decision-makers adjust their policy, ameliorate or reinforce certain positions. All the numbers are down now in black and white.

The report emphasizes the aging of France's research population (55 percent of them are 40-55 years of age). Another sobering statistic: France is spending only 63 percent as much as Germany for R&D. That country devotes a relatively larger share of its productive apparatus to industrial activities, particularly in sectors that require a fair amount of R&D (automobiles, capital goods, chemicals).

On the other hand, the authors of the report note with pleasure that France, which produces 4.8 percent of the world's scientific publications and 17.7 percent of those coming out of the EEC, is maintaining its position in the face of increased worldwide competition. Likewise, France's percentage of world patent filings (3.4 percent of those filed in the United States, 8.8 percent of those filed in Europe) shows our country is holding its own, even though the EEC as a whole is tending to lose ground.

Paris Region

At the regional level, there are few surprises. The Paris region has 52 percent of all public-sector researchers and engineers, gets 46 percent of the public funds spent on research, performs 76 percent of the industrial research, and generates 45 percent of French patents filed in the European system. Next in importance are the Rhone-Alpes and Provence-Alpes-Cote d'Azur regions, respectively accounting for 10 and 8 percent.

Comparisons with Europe and the rest of the world indicate basic research is in good shape in both France and Germany, a fact confirmed by the increased capacity of these two countries to carry their research into the newest scientific domains. France has made advances in the fields of biomedical research, physics and mathematics, while Germany has done the same in the fields of chemistry and physics, the United Kingdom in clinical medicine. Nevertheless, France for the moment seems helpless against the rising technological power of Germany, which files three times as many patents as France in the United States.

On a worldwide basis, the EEC-United States-Japan triad accounts for 70 percent of all scientific publications and 80 percent of patents filed in the United States. But since 1982 Japan has increased its share of global scientific publications by 16 percent and its share of patents filed in Europe and the United States by 44 percent.

The authors of the report say the EEC makes a scientific contribution disproportionate to its spending: "One

dollar of EEC R&D money produces 1.3 times as many [scientific] publications as one dollar of American R&D." By contrast, Europeans are not doing well at turning scientific potential into profit. Thus "one dollar of Japanese R&D produces 1.5 times as many patents filed in the United States as one dollar of American R&D, and 1.7 times as many patents as one dollar of EEC R&D."

Footnote

1. The Ministries of Research and Technology, Defense, Economic and Financial Affairs, Industry, Posts, Telecommunications and Space, the National Center for Scientific Research [CNRS], the National Space Studies Center [CNES], the Atomic Energy Commission [CEA], the National Institute of Health and Medical Research, the National Agronomic Research Institute [INRA], the National Technical Research Association.

Germany: Battelle Institute Seeks To Apply Research

92P60018A Berlin *ING DIGEST* in German Oct 91
pp 32-33

[Article by Klaus Ziegert; first paragraph is *ING DIGEST* introduction]

[Text] From soft wax and fine cotton wool, a pliable ball is formed which provides peace for persons suffering from noise. But the manufacturer felt that the production of Ohropax by hand in work at home was no longer in keeping with the times. A task given to the Battelle Institute made the seemingly impossible possible: the researchers in Frankfurt found an effective connection between wax, cotton wool, and high tech. *ING-DIGEST* editor Klaus Ziegert heard how success is achieved from things which are needed.

"I am a technology fan," admits Dr. Guido Tschulena, who is responsible for marketing sensor technology at the Battelle Institute in Frankfurt. "But one must also be able to sell it." With the charm of a person born in Vienna, he gives suggestions for the customers from the new FRG laender, who today also have access to the know-how, facilities and studies of the world's largest private, independent supplier of technology. In this context, Tschulena sees opportunities especially for many small and medium enterprises in eastern Germany who did not have GDR engineers before unification. "With good ideas and technology they indeed can occupy a new market niche. But they must have a plan for sales, there is a need to catch up in this regard in the East."

Battelle itself provides many important contributions to investigating markets. For example, it evaluates all relevant information about an area of technology and identifies new focal points. Dr. Tschulena holds in his hand a silicon wafer with anisotropic etching. "This is the material for micromechanical components. A revolutionary area of technology in the 1990s, comparable with

microelectronics in the 1990s. The ink jet printer is a typical product of micromechanics. The integration of sensors, actors, microelectronics, channels and so forth in one technology will enable inexpensive mass production. High growth is expected from pressure and acceleration sensors in particular," he says, giving the initial results of a study which Battelle is working on. Battelle has also involved the Dresden Microelectronic Center in this worldwide study.

Since the fall of 1987, the Hessian minister for economy and technology has supported the technology project of solar energy and hydrogen technology. It is a joint project of Hessian universities, institutes (including Battelle) and firms in the form of an information system on research and development as well as on products, applications, working groups and persons. Its goals are to obtain, process, and present information on the state of development in this area of renewable energy through a data base, publications, seminars, and personal information. It is a specialty of Dr. Gerd Sandstede, director for technology marketing in Frankfurt. Since late 1989 the institute has had four installations for ion beam technology to produce very modern, inexpensive thin-layer components such as solar cells and sensors. One of the development goals is to deposit highly pure gallium arsenide and silicon layers on cheap polycrystalline or glass substrata. "For me the solar cell is the most elegant solution of the renewable energies. If one succeeds in the next two years in attaining an efficiency of about 11 percent, that would be almost optimal," assesses Sandstede, who himself as a Battelle chemist did pioneering work in fuel cells.

Battelle still receives money from government bodies for the research on renewable energy. But the tendency is clear: such money is becoming rarer. Rethinking began in the 1980s when the budgets were drastically cut. Even in the late 1970s, public bodies were involved in about 70 percent of the business volume. Dr. Franz Sacherer, marketing manager in the area of biotechnology and environmental research, explains the realignment of the research enterprise from his point of view: "For decades we conducted only research and development, it was the customers who made products out of the results. Now we are thinking more strongly in terms of products, such as microorganisms for manufacturing, or processes and devices for environmental protection."

During the years of pure research, the "feedback from industry" was lacking, according to Sacherer. Now, and not only in this area, the process technology is carried out until production maturity, that is, up to the pilot plant level. "This marketing strategy has grown in a classic manner," explains Dr. Sacherer. When the American Battelle Memorial Institute brought the idea of its founder Gordon Battelle to Europe that a changing world could be best improved "by progress in technology and training," the idea of researching under contract had already gained ground in the United States.

The first government customer for the new institute in Frankfurt am Main was the Federal Ministry of Defense. A remarkable project is now underway with support from this same ministry: the development of a human cell artificial skin. Sacherer explains: "From a square centimeter of skin we can now grow a square meter of cellular artificial skin within three weeks." The project is significant for skin replacement in large burns and chronic wounds, but also as an alternative to animal testing to determine the compatibility of chemicals and cosmetics. Thus the project is capable of being marketed.

For marketing is now the name of the game. Battelle has set the goal of taking more advantage from its large intellectual assets. "Nowadays it has become more difficult to get development money for a good idea," observers engineer Hans-Joachim Hampel, head of the department of environmental and processing technology. The business area of energy, environmental and security technology formerly was called engineering technology. Engineers of various specialties, along with physicists, chemists, and other specialists, combine their knowledge and ability there. Hampel: "With the variety of disciplines, we can take advantage of our strength!" And these strengths are in demand, for example for investigations of environmental compatibility, or plans for energy supply. While I am talking with the department head about his "highlights," negotiations are going on next door with customers from eastern Germany. The Hyzet restoration society is interested in the optimum solution to remove old wastes from the terrain of the hydrogenation plant in Zeitz. These solutions will certainly be found: Battelle has a lot of experience in problems of this sort.

One of Hampel's favorite projects is paper deacidification. The pilot plant is in Frankfurt. "Eighty to a hundred books can be deacidified in the treatment chamber at the same time," he explains. "We built this chamber to maintain holdings of German libraries and archives. For otherwise the paper made in the last 150 years will deteriorate from acid damage." By the end of next year, the German Library in Leipzig is supposed to get such a facility.

Another promising market is the technology for sludge draining and use. Since the necessary annual dredging of ports creates a problem of depositing the contaminated excavated material, Battelle is working on an alternative idea. A thermal variation of removal, through pelletizing and sintering, would lead to harmless silt pellets which can be used, among other things, as filling material in construction work. "An option for the future," Hampel summarizes, "since it hardly costs any more than depositing the sludge in special dumps, but it gets rid of it."

Among the Battelle offerings of technology on demand are also custom-made materials, including processes to manufacture them. Dr. Karl-Heinz Gruenthaler, head of the materials development department, picks up an inconspicuous wire ring: "High temperature superconductor." Liquid nitrogen is sufficient for cooling it. For a

couple of years, Battelle has been working with industry on the production of compound wires made of ceramic and metal. Another specialty is fiber-reinforced light metals which have a high degree of thermal stability. "Basically we apply materials science to custom made materials. Today, and even more so tomorrow, materials must be nontoxic, but reliable, recyclable, and much more." In addition to the technological advantages, one must also estimate the consequences of the technology. Gruenthaler formulates the maxim "To put research at the service of humans and the environment." Certainly the ambitions of the researchers are not always fulfilled during research under contract, with the strict protection of the anonymity of the customers. Thus there is room for visions of the future. "If one succeeds in attaining a continual change in the physical qualities of materials! Glass where you can adjust the index of refraction and dispersion...."

Battelle is continuing to concentrate its forces so that more and more things succeed. After the centers in Frankfurt and Geneva, as well as the offices in London, Paris, Milan and Bonn were merged into Battelle Europe, now one wants to cooperate more closely with the American organization, such as in self-financed research to break into new markets.

Bonn To Become Center of Research, Technology

92P60028A Duesseldorf *HANDELSBLATT* in German
18/19 Oct 91 p 7

[Article by rei]

[Text] Federal Minister of Education Rainer Ortleb (FDP) and Federal Minister of Research Heinz Riesenhuber (CDU) want to expand Bonn, the long time federal capital, and its surroundings into a "science zone."

After the parliament and key areas of the government are moved, the Bonn region is supposed to be characterized more than before by establishments of research, education, and science. In their joint plan, the two ministers propose that numerous institutes be moved from Berlin to Bonn.

Thus the Science Center for Social Research, the Heinrich Hertz Institute, the Federal Institute for Vocational Education, the Max Planck Institute for Educational Research, and the Federal Institute for Industrial Medicine are supposed to move from Berlin to Bonn.

Riesenhuber and Ortleb are also thinking of numerous new creations or expansions of existing establishments. For example, the University of Bonn could gain a school of technology with chairs for biotechnology, information science, environmental technology and materials research. An alternative for these ministers would be an institute for technology in Bonn. In addition, the economic and social sciences, particularly industrial management, would be strengthened at the University of Bonn.

The new establishments which are envisioned include a Bonn/Siegburg technical college, a European language institute, an office for education and science in Europe, and even an art college. In addition, non-university research centers are to be located in Bonn. Ortleb and Riesenhuber mentioned chemical centers of the former GDR Academy of Science and an institute for synchronous radiation. Moreover, the panorama of scientific institutes in Bonn is to be enriched by a Max Planck Institute for Theoretical Physics, an institute to research developing countries, as well as an institute to assess the consequences of technology in a European context. Three new institutes are to deal with vocational education.

A science park, along the lines of similar institutions in Washington, Paris or Zurich, will convey science and technology to the broad public.

Ortleb and Riesenhuber expressed their confidence that the new establishments, together with existing ones such as the German Research Community, the German Academic Exchange Service, and the German Space Agency (DARA) will provide a good basis for the expansion of Bonn into a forward-looking science center. There could also be a future high tech focus on biotechnology, if such existing establishments as the Cologne Gene Center or the Juelich research center are included in the plans.

Netherlands: Scientific Progress Report Presented

92AN0065 Zoetermeer *WETENSCHAPSBELEID*
in Dutch Oct 91 pp 3-4

[Excerpts] Normally at this time of year, this magazine features an extensive article on the new "Science Budget." However, Minister of Education and Science Ritzen has decided to publish this budget biannually, because science policy is increasingly being based on long-term strategies. There is no need for it to be adjusted annually. From now on, the minister will send a progress report to the Second Chamber each year the Science Budget is not published. The following is an overview of the most important items. [passage omitted]

International Research Centers

In the 1991 Science Budget, Minister Ritzen stated that one of his major objectives was to give Dutch research an international scope and image. This subject is again being given ample attention in his progress report to the Second Chamber, in particular the attraction of international research institutes, the aerospace program, and EC initiatives.

As of 1992, Ritzen is to allocate an annual amount which will make it possible to react efficiently to opportunities for attracting international research centers to the Netherlands. The 1992 allocation amounts to 5 million Dutch guilders and will be increased to 10 million guilders in subsequent years. These funds may also be used to

upgrade Dutch institutes to an international level. Investigating interesting opportunities will be the responsibility of the Netherlands Scientific Research Foundation (NWO) (mainly in the area of fundamental research) and of the coordinating minister (mainly in the area of strategic research). The latter will involve the specialist ministers in the procedure.

Aerospace

On 18 and 19 November, an ESA ministers' conference on Europe's long-term aerospace program will take place in Munich. Decisions are to be made with regard to the application of microgravity research and the Earth Observation Program. The latter in particular is of great significance as it will provide a large amount of essential information on global environmental issues such as deforestation, climate changes, and the rising sea level. Construction of the European Hermes shuttle will also be discussed. The budgeted costs for this project are 30 percent higher than estimates made at the previous ministers' conference in 1987 due to extra safety requirements and further developments in the design.

The total ESA budget will increase from 4.5 billion guilders in 1990 to 8.5 billion guilders in 1995 if all planned proposals are carried out. In 1987, the Netherlands annual contribution was fixed at 187 million guilders beginning in 1990. Some 63 million guilders of this amount is taken from the budget of the Ministry of Education and Sciences; Economic Affairs has to provide 105 million; Transport, 9 million; Defense, 6 million; and Welfare, Health, and Culture, 4 million.

Equipment

J. Irvine of the University of Sussex has recently completed a comparative analysis of worldwide scientific research equipment levels. This study, which had been commissioned by the ministry, shows that the Intentional Equipment Scheme (IAS) is highly instrumental in solving equipment shortages at para-university institutes. Minister Ritzen is now increasing the overall IAS budget by 1 million guilders for the acquisition of medium-range equipment (costing between 100,000 guilders and 3 million guilders) to meet increased demand with regard to previous years. The budget for medium-range equipment now amounts to 12 million guilders. The shift is at the expense of large equipment, which is now budgeted at 23 million.

In addition, the IAS budget also provides, for the first time, 5 million guilders for universities. These funds will be used for equipping research schools. In anticipation thereof, money has already been made available for a few projects.

Science Center

Both Minister Ritzen and his counterpart in Economic Affairs basically agree to support the establishment of a national science center. The objective of such a center would be to inform the public and to popularize science

and technology. If a viable initiative with sufficient nongovernment financial resources is proposed, the originator will be entitled to a contribution by the ministry. By providing their support, the ministers are anticipating the government position on the recommendation by the Public Information Office for Science and Technology (PWT). [passage omitted]

CORPORATE ALLIANCES

Matra-Marconi To Build Satellites for British Aerospace

92WS0212A Patis LE MONDE in French 10 Dec 91
p 22

[Article: "New Alliance Looms in Satellites: British Aerospace Contemplating Link-Up With Matra-Marconi"]

[Text] Is British Aerospace [BAe] going to entrust its satellite business to the Franco-British Matra Marconi Space team? The possible partners are currently engaged in very serious talks that, according to rumors in the British capital, are verging on successful completion. As an industrial group operates in dispersed domains, to say the least. Besides defense, its primary field, these include aeronautics, automobiles with Rover, and real estate, among others. And British Aerospace is miring deeper and deeper in its troubled strategic splits.

British Aerospace's Space Division lost 190 million francs [Fr] in the first six months of the year. Matra Marconi Space, on the other hand, like all the players in the satellite sector, has is engaged in a frantic drive to attain critical size. The group, 51-percent controlled by France's Matra, and 49 percent by GEC-Marconi, was badly shaken when Germany's Deutsche Aerospace, France's Alcatel, and Italy's Aelenia formed their alliance. The taking over of BAe's satellite activities is, for Matra Marconi Space, an opportunity of the first order.

Aerospatiale, Thomson-CSF Discuss Joint Anti-Ballistic Missile System Development

92WS0110A Paris LES ECHOS in French 25 Oct 91
p 10

[Article by Alexandra Schwartzbrod: "Aerospatiale and Thomson-CSF May Step Up Their Collaboration"; first paragraph is LES ECHOS introduction]

[Text] The two groups are already partners on surface-to-air missiles and plan to join forces on anti-ballistic systems. At road's end is a market worth several tens of billions of French francs [Fr].

After deciding to carry out an ambitious program of collaboration on surface-to-air missiles, Aerospatiale and Thomson-CSF may soon find themselves at the center of a vast European, or even Euro-American, cooperative effort on anti-ballistic missile systems. The CoSyDe consortium formed by the two manufacturers in

1986 to reflect on future threats and ways of countering them—and which had so far limited itself to doing some studies for the SDIO (Strategic Defense Initiative Organization) in the United States—may be seriously activated.

The consortium, which maintains a very low profile, employs no personnel, and generates sales of less than 30 million French francs [FR] a year, has gained special importance since the Gulf War and the upheavals in Eastern Europe. For although "Star Wars" as imagined by Ronald Reagan has sputtered out, defense against ballistic missiles has become one of the big priorities of certain governments endangered by proliferation in the South or uncontrolled launches from the East.

Hence the reason for the interest of Pierre Joxe, smitten by high technology and space systems, in research that may even enable France and the United States to collaborate (according to a report recently submitted to the Defense Ministry by the DGA, General Weapons Delegation). The Americans have decided to shift the focus of the SDI program to protection against the limited strikes of ballistic missiles (GPALS) and have lately been putting the squeeze on Europe to join in, both for financial and political reasons.

In such a context, France is a choice target. It is developing an anti-aircraft defense system with antimissile capabilities within the Eurosam consortium, which includes Aerospatiale and Thomson-CSF as well as the Italian firm Alenia. The Pentagon, whose systems (Arrow and Erint) are much less advanced, is keenly interested in it. According to the American review "Defense News", the French government may soon grant two contracts with that fact in mind.

The first, worth just over Fr200 million, has reportedly gone to CoSyDe to study the technical feasibility of an anti-ballistic missiles system capable of zone defense. The consortium recently demonstrated that it could be developed and deployed in less than 10 years for a cost of between Fr30 and 50 billion. The second contract, for nearly Fr700 million, should be awarded to the Eurosam consortium to study the adaptation of its SAMP (medium-range surface-to-air) system to anti-ballistic missile weaponry.

The German government is very sensitive to the risks of uncontrolled launches, and may join the undertaking with MBB and Siemens as subcontractors. A formal agreement is expected to be signed in the coming weeks as a result of negotiations now underway among the French, German, and Italian Defense Ministries on the question.

Thomson-Siemens Semiconductor Merger Plans Cancelled

92AN0033 *Antwerp DE FINANCIËLE-EKONOMISCHE TIJD* in Dutch 16 Oct 91 p 11

[Text] Paris—The French defense electronics firm Thomson-CSF has discontinued its efforts to merge its

semiconductor subsidiary SGS-Thomson Microelectronics with the semiconductor division of the German company Siemens. Thomson now intends to cooperate with American semiconductor manufacturers.

Thomson-CSF's unsuccessful attempt constitutes another setback for the French Government's campaign to create a European industrial policy to counteract Japanese competition. Executives of state-controlled Thomson have always maintained that the merger was essential in order to make European semiconductor manufacturers large enough to hold off the Japanese.

Thomson President Alain Gomez, who announced that negotiations had broken off, denied rumors that he was only looking for a buyer for SGS-Thomson. He hopes that loss-making SGS-Thomson will "break even" next year and believes that the semiconductor subsidiary has a positive future.

SGS-Thomson is managed jointly by Thomson-CSF and a division of the Italian state holding Institute for Industrial Reconstruction (IRI).

A Siemens spokesman commented that Thomson's announcement was nothing more than a public confirmation of the Siemens point of view, namely that merging with SGS-Thomson is not a good idea. Siemens has always opposed a possible merger for fear of too much control by the French Government on the joint operations. In addition, the merger could also interfere with technological agreements recently concluded with IBM.

Results

Thomson-CSF announced that profits had increased by 5.6 percent during the first half of the year. It reviewed its forecast that 1991 would bring a strong growth in profits. Net profits of the French defense and electronics concern increased from 1.07 to 1.13 billion French francs (Fr), despite a 5-percent decline in turnover (from Fr17.36 to 16.5 billion). Thomson-CSF, for 60 percent owned by the Thomson holding, said that slow trade in the Middle East was the major cause of declining revenues.

The semiconductor subsidiary SGS-Thomson, the joint venture between IRI and Thomson-CSF, incurred a loss of Fr135 million. Its overall loss now amounts to Fr356 million. On the basis of results in September, Thomson president Gomez remained optimistic for the last quarter of 1991.

France: Bull Acquires Swedish Telecommunications Firm

92WS0112A *Paris LE MONDE* in French 25 Oct 91 p 34

[Article: "Bull Takes Control of Sweden's Diab Data"]

[Text] On Wednesday 23 October the French computer maker Bull announced its acquisition of 75 percent of the

stock of Sweden's Diab Data AB. Purchase price was not disclosed. Diab Data, a firm specializing in provision of Unix-standard operating systems, was until now a wholly-owned subsidiary of the Swedish telecommunications utility Televerket, which will keep 25 percent of the stock via its investment subsidiary Teleinvest AB. Diab Data AB—which retains its name, board of directors and managerial autonomy—now becomes a subsidiary of Bull Scandinavia.

This acquisition strengthens the French computer company's position in open systems and service integration in Scandinavia. The subsidiary will serve as the structural foundation of the future Systems Integration Center Bull plans to establish in Scandinavia.

Thomson-CSF Subsidiary To Acquire Share in British Electro-Optics Firm

92WS0112B Paris LE MONDE in French 27-28 Oct 91 p 21

[Article: "European Commission Authorizes Thomson-CSF To Acquire 49.99 Percent Interest in Pilkington Optronics"]

[Text] The European Commission on Friday 25 October gave approval for Thomson UK, the British subsidiary of Thomson-CSF, to acquire a 49.99 percent ownership position in England's Pilkington Optronics, a subsidiary of British Pilkington specializing in optical and electronic systems used for lasers and infrared vision. Thomson-CSF, a big name in military electronics, has annual turnover in excess of 76 billion French francs and a strong position in the French and Near East markets. Pilkington Optronics has markets in the United Kingdom, the Commonwealth countries and the United States. The Commission held that the new conglomerate would not have a dominant position, since defense ministries are the only customers for its products.

Peugeot, Citroen Fusion Reviewed

92WS0085A Paris INDUSTRIES ET TECHNIQUES in French 4 Oct 91 pp 40-42

[Article by Michel Alberganti: "Research: 'Cohabitation' Between Peugeot and Citroen"; first paragraph is INDUSTRIES ET TECHNIQUES introduction]

[Text] PSA [Peugeot Corporation] is reorganizing its research division. The objective: to design vehicles more quickly and at lower cost. There is no reason to fear, though, that Citroens will become Peugeot clones. With regard to styling, the new arrangement actually increases the independence of the two makes....

Is Peugeot in the process of swallowing up Citroen? That question, which is of most immediate concern to the latter's employees, is raised at every new stage of the PSA group's reorganization—most recently with the announcement the research units of the two makes

would start working more closely together as of 9 September. Some observers jumped too hastily to the conclusion that future models of Peugeot and Citroen would begin to look alike, even predicting the two brands would be amalgamated into one—with Citroen being gobbled up by the same Lion that recently swallowed a certain Talbot.

But that would be jumping too hastily to conclusions. The idea does not withstand a detailed analysis of the facts and what they reveal about PSA's medium-term strategy. The new research structure of the two builders is actually going in exactly the opposite direction: Each builder's development teams will be more independent than at present. The proof? Under the old arrangement, the first prototype of a new model was created by Etudes PSA, an entity controlled jointly by the two builders. Thus both worked together to manage the project during the first 18 months, before it was handed over to the Peugeot or Citroen research unit. Henceforth, the preliminary work will be handled by the builder's own "in-house" team, which will thus exercise total control over vehicle design, from styling studies to prototype fabrication to industrial production. PSA, for its part, is concentrating on development of components common to several models (engines, suspension systems, body paneling, etc.).

The restructuring may have implications that go beyond PSA, perhaps even beyond the automobile industry. Goaded into action by Japanese and European competition, PSA is implementing an ambitious reorganization that should enable it to compete with the world's top auto makers by 1999, when barriers against Japan finally come down. To reach that level of competitiveness, the group is pursuing all the state-of-the-art methods that will dominate the manufacturing environment of the 1990's. In addition to structural modifications, the changes at PSA are significant because they reveal the strategy adopted to energize an industrial group that employs 159,000 people.

The stated objectives of the new organization are both quantitative and qualitative. Luc Epron, chief of Citroen's marketing department, recalls the work of preparing what he calls "the Tablets of the Law," the product development charter PSA promulgated in 1989 as the ideological foundation for the current changes. "When we started, the charter gave higher priority to speeding up the process, but now quality has become the be-all and end-all." In short: Do it well, and do it quickly. And right behind those watchwords: Do it as inexpensively as possible. Jean-Yves Helmer, director of PSA's automobile division, has spoken in detail about the quantitative aspect (INDUSTRIES ET TECHNIQUES No. 711, p 13): shortening development time from five to four years by 1994, then to three years by 1999; reducing costs by 20 to 25 percent. Quality is more difficult to measure: The customers will be the final judge.

Achieving these goals is complicated by the fact that the organization is made up of three distinct entities: the research units of PSA group, Peugeot and Citroen. The two main features of the new structure are a new division of labor among the three entities, and introduction of a "project director" and his team, dubbed the "technical deck."

Quality

Luc Epron says the concept that dominated preparations for the reorganization was to "increase coherence. To do that, we asked ourselves a very basic question: What are the types of expertise that go into building an automobile?" PSA identified four technical domains: motors, engineering (gear-boxes casings, transmissions, suspension systems, brakes, etc.), body-work and materials. According to Epron, these specialized domains require expertise that is independent of the vehicle being built. The "motor" experts, for example, strive for a deeper understanding of the combustion process, while "engineering" works on systems to control gear-shifting. The "materials" team does research on metals and plastics, to give the research units options from which to choose. As we know, these important decisions must take both physical/mechanical characteristics (weight, resistance, rigidity, etc.) and manufacturing techniques into account. These criteria—which are being continually revised—determine whether an engine block should be made of iron or aluminum, whether the body will be built of steel or composites. Even more mysterious is the mission of the "body" experts. Epron himself admits "the boundary between basic and applied [research] is still somewhat imprecise." He indicates, nevertheless, that "body" experts work on very "upstream" problems, such as the energy absorption of the side bars that ensure the vehicle's rigidity in event of impact.

In accordance with this concept, vehicle design will henceforth be divided into two phases: The PSA expert groups will work constantly to improve the basic components, while Peugeot and Citroen research units exploit that knowledge and integrate it into new models. But while the principle is simple, its application is not. In reality, the two branches are not independent. Epron tries to explain this by noting that the activity of the expert groups has two dimensions: "One is purely technical, the other is temporal." In fact, the teams collaborate where appropriate to move the model design process forward. On an as-needed basis, they come to the assistance of the research units during development phases that require their know-how. This relationship, which is important to the second major objective of the reorganization, is directly tied to the simultaneous engineering approach (INDUSTRIES ET TECHNIQUES No. 710, p 15). And the quality of that relationship will determine whether PSA reaches its objective of cutting down on development time.

The new procedure is based on separating development of new components from new model design. In other words, model-specific engineering projects are kept to a

bare minimum. For example, engineers would no longer design an entirely new suspension for a new model. The result: An increasing number of components will be common to more than one vehicle. The expert groups are responsible for their creation. The research units use their expertise to come up with a "synthesis," i.e., a package of components that will be assembled to constitute the future model. Thus it should not be surprising that the expert groups are organized into a unit common to both auto builders: PSA's Directorate of Automobile Technologies at La Garenne.

Ideally, in terms of getting a new model to market as quickly as possible, the work of the research divisions would be limited to putting parts together: choosing and assembling the components needed to satisfy top management's demands. Unfortunately, a vehicle must meet so many requirements that it cannot be broken down into standard elements. It must be "beautiful" and have "character," for example. This is the domain of the "style" experts in the research division who determine every external and internal feature of the future automobile. The builders often turn to real artists to help them in this phase—people like Italy's Pininfarina, who designs both Ferraris and Peugeots. Top management chooses from among the many sketches and mock-ups prepared. A first "drivable" prototype is then built. Once it is approved, the industrialization phase begins. All the vehicle's parts are designed with mass production in mind. This is a phase where harsh realities must be faced... and time is often lost. If the initial design work failed to take manufacturing problems adequately into account, there is a lot of back-and-forth between the "styling" experts and research units. PSA is trying to cut this totally unproductive "trial and error" period to a minimum.

It is approaching this problem from two different directions: re-establishment of independent teams in the research divisions of each builder, and creation of a "project team." Before the reform, preparation of the first set of vehicle specifications was managed by PSA's Technical Directorate, in conjunction with the applied styling teams of Velizy (Citroen) and Sochaux (Peugeot). The resulting prototype was then turned over to the builder's research directorate. Today, the latter oversees the entire project. It oversees both definition of specifications ("synthesis") and decisions on styling. This reduces the risk of running into design problems further downstream. But it is not enough. To ensure perfect "coherence," it has proven necessary to create a personnel structure that is somehow "identified" with the new vehicle. Such personalization goes even beyond the concept of the team: It focuses on a single individual, the Project Director (DP). His function is a real innovation in the manufacturing industry. It serves to catalyze the energies of the various branches of the company. At PSA, the DP is supported by a team called the "technical deck" which stays in existence throughout the development stage. Nevertheless, its composition varies over time. At different phases, the "deck" may be composed

of up to 200 or 300 people. But the heart of the team is made up of about 20 permanent personnel representing all the functions of the enterprise. At PSA, these 20 "section chiefs" represent Quality, Styling, Research, Methods, Manufacturing, Management, Planning, Purchasing, After-sales Service, etc. Another innovation: putting subcontractors on the team. Already two engineers—one from Usinor, the other from Saint-Gobain—are members of operating technical deck teams at Peugeot and Citroen.

The role of the project team is crucial. Jean-Yves Helmer explains that it "optimizes the development process by bringing together all the parties working on the project at a given moment." He adds this corollary: "To function, such a system must be under the direction of a strong authority." And the DP does have considerable authority. Organizationally, he is directly responsible to the general managers of Peugeot and Citroen, Marcel Provent and Xavier Karcher. PSA currently has three DP's. The first, Mr. Heinrich, was named to his position in 1990. Epron explains that this former director of the Automotive Mechanics Company of the East (SMAE) was chosen because of his performance as leader of an important unit. What he doubtless calls "his" project—the first to benefit from the new organizational structure—will come out in 1994.

When it is pointed out to Jean-Yves Helmer that rival Opel has just launched the Astra applying a method very similar to PSA's, he remains imperturbable. "Our reorganization was launched in 1989 after making the rounds of European, American and Japanese builders. We found we were among the front runners. Renault is right up there, too: Although its development cycle is longer than ours, it is very advanced in terms of project team organization." All the builders seem to have been won over to the new method. The race against the clock has begun.

Why Keep Citroen?

Some automobile industry observers believe that three makers of general-purpose vehicles is at least one too many for France. Gerard de la Fortelle, associate director of the Boston Consulting Group in France, says he is not sure what is the best solution: "Amalgamations are not necessarily the answer; they would be so costly over the next five years that we cannot be sure they would be successful." Also, PSA's current marketing strategy does not lend itself to fusion. Both Peugeot and Citroen, for the first time in their history, have a full gamut of vehicles: five models for the former (106, 205, 309, 405 and 605), four for the latter (AX, ZX, BX, XM). Most of these models are in direct competition. Under these conditions, it would be impossible to fuse the two lines without an absolute loss in sales volume and market share. On the other hand, being in the same group encourages synergies and economies of scale. The restructuring of research entities is a direct consequence of this line of thought. Citroen's ultimate fate largely depends on the market success of the XM and especially

the ZX. The 1991 recession has left the manufacturers in a vulnerable position. The failure of a single model could be catastrophic. That is why builders are so intent on reducing the time and the cost of bringing out a new vehicle. These were precisely the main objectives behind the reorganization of research at Peugeot and Citroen.

German Company, Ericsson Establish Telecom Joint Venture

92MI0070 Stuttgart LASER UND
OPTOELEKTRONIK in German Oct 91 p 19

[Text] Hans Kolbe & Co/FUBA of Bad Salzdetfurth and Telefonaktiebolaget LM Ericsson of Stockholm have announced their intention to found a joint subsidiary. LM Ericsson will hold a 51-percent share. The subsidiary will work on public digital transmission engineering with particular reference to the new networks of the nineties, and will be situated in the Hildesheim area.

High staffing levels are planned in view of the obvious upward trend in the telecommunications market.

FUBA has many years' experience in public digital transmission engineering and is also a supplier of DBP [Deutsche Bundespost]. When founding the new company, FUBA will take the public digital transmission product range out of its data transmission department and incorporate it into the subsidiary. Ericsson is one of the international leaders on the telecommunications market and has 70,000 employees in 100 countries.

Zeiss Optical Ends 45-Year Separation

92GE0102X Frankfurt/Main FRANKFURTER
ALLGEMEINE in German 12 Nov 91 p 19

[Article by mih: "Carl Zeiss Oberkochen Pays DM1 for Zeiss Jena. Forty-Five Years of Separation End"]

[Text] Oberkochen, 11 Nov—The merger of Carl Zeiss, Oberkochen, with Carl Zeiss Jena GmbH, Jena, is finally complete. The contract involving this company was signed on 7 November. With that, in the words of Horst Skoludek, spokesman for the executive board of Carl Zeiss, Oberkochen, "the 45-year separation of the Zeiss companies in Oberkochen and Jena is over." Carl Zeiss, Oberkochen, assumes sole leadership of the company as well as 51 percent of the shares in Carl Zeiss Jena GmbH, which operates the core business with optical instruments of the former Jenoptik Carl Zeiss Jena GmbH. The second successor company, Jenoptik GmbH, which belongs wholly to the Land of Thuringia, holds the remaining 49 percent.

Carl Zeiss Jena GmbH receives 587 million German marks [DM] in starting capital from the Trust Agency. Of that, Jenoptik GmbH will take over land, buildings, facilities, and the crystal-growing factory in Eisenberg for a partial amount of DM117 million. DM116 million are to be invested in machines and buildings. This amount may possibly increase by DM150 million, if the

Land of Thuringia provides funding for the promotion of investments in the amount of DM34 million. DM110 million will be used as initial capital resources: DM40 million in capital stock and DM70 million in reserves. The remaining DM244 million are intended to help cover the losses anticipated in the first few years.

For the 51-percent share Carl Zeiss, Oberkochen, paid the symbolic price of DM1. The remaining 49 percent can also be taken over for DM1. Although the west German Zeiss company did not put up any contribution of its own for the takeover and startup financing, Michael Hiller, spokesman for the managing directors of Carl Zeiss Jena GmbH, speaks of a "tremendous volume of monetary value" which is brought in by Oberkochen. The eastern German side now has Zeiss's international marketing and service organization as well as the electronic data processing system available to it. Furthermore, parts of the manufacture which were previously located with outside companies will now be moved to Jena. In addition, personnel assistance, production methods, and production technologies are to be made available. Skoludek estimates this "package" at DM250 million. Carl Zeiss Jena GmbH, with 3,000 employees, will have a turnover of about DM200 million next year, according to Hiller's expectations. He is not able to predict the amount of losses. The manufacturing program is divided into the areas of microscopes, medical optical equipment, earth measurement, industrial measurement technology, astronomy, planetariums and crystals. Parts of the so-called core business remained at Jenoptik GmbH, however: semiconductor equipment, laser technology, and space technology are now competing with Zeiss. Not until recently did Carl Zeiss Jena GmbH take over additional parts of the medical optical equipment and the precision instrument technology areas, whereby the originally planned number of 2,800 employees has grown by another 200.

In Skoludek's words, Carl Zeiss is an "independent company, complete with all levels," with development, production and administration as well as marketing and thus by no means just the "extended workbench" of Oberkochen. Carl Zeiss Jena GmbH, being the subsidiary of Carl Zeiss, Oberkochen, is not a foundation enterprise. The employees thus have no claim on the extensive pension commitments according to the Zeiss statute. Inclusion in the foundation enterprise is planned for a point in time when profits are being generated which are sufficient to endow the pension reserves and to "assure the future of the company." Skoludek estimates a period of at least five years for that.

All brands and names with the Carl Zeiss component belong to the Carl Zeiss foundation, which in the future will have a double seat in Heidenheim/Jena. In order to use the name Carl Zeiss and the brand name Carl Zeiss Jena with the lens frame logo formerly used in the east, various "use-up periods" were agreed on with Jenoptik GmbH which will end no later than 31 December 1992.

The two successor companies to the former Jenoptik Carl Zeiss Jena GmbH will cooperate in subareas: Zeiss makes available to Jenoptik data processing capacity and space for new technologies and delivers optical components as well as crystals. In return, Jenoptik makes available capacity for optical coating technology and research. The precondition of Carl Zeiss Jena GmbH for concluding the agreement was the fundamental agreement of 25 June 1991 under the leadership of the Trust Agency. A decision was made at that time to give Jenoptik Carl Zeiss Jena GmbH the amount of DM3.3 billion for reorganization.

Germany's MTU Joins Rolls Royce-Led Helicopter Engine Program

92MI0056 Bonn DIE WELT in German 25 Oct 91 p 5

[Text] A memorandum of understanding has been signed in Munich between DASA [Deutsche Aerospace] subsidiary MTU (Motor and Turbinen-Union) and the Franco-British firm Rolls Royce-Turbomeca Ltd. On the RTN 322 helicopter engine program that has been running since 1980. Since 1986, Italian engine manufacturer Rinaldo Piaggio has also been involved. Previously, Rolls Royce and Turbomeca each held a 45 percent stake in the project and Piaggio 10 percent. MTU of Munich now wants to come in with 15 percent, which will necessarily mean the other partners holding fewer shares. The awaited contract will be signed next year, an MTU spokesman said. The most important issue to be settled before then is the engineering component that the German partner will contribute.

At the signing of the memorandum, MTU Deputy Chairman Jost Schmidt referred to the fruitful cooperation between the firms in the past, for example on another engine project, the MTR 390, that was developed for military purposes. But, the MTU manager noted, they were realistic enough to know that such cooperation would not always be easy. They could not afford to go it alone, so readiness to compromise was paramount. They had sought a partnership for the RTN 322 back in 1985, when a "European Small Gas Turbine Agreement" was concluded between Piaggio, Rolls Royce, Turbomeca, and MTU. The European RTN 322 project is intended for military purposes in the first instance, but MTU deputy chief Schmidt considers subsequent civilian use possible. There is only one definite customer so far: the British Royal Navy, which intends to buy 50 of the engines for the newly developed EH 101 military helicopter. Otherwise, the RTN 322 rotary wing engine is being considered primarily for the future NATO NH 90 transport helicopter.

Germany: AEG Subsidiary Sold to Alcatel Group

92MI0057 Bonn DIE WELT in German 25 Oct 91 p 15

[Text] The grand sale at AEG AG continues. At the end of this year, AEG Kabel AG in Moenchengladbach, will be taken over by the French Alcatel subsidiary Alcatel Cable S.A. of Clichy, Paris. The agreement now only

requires the consent of the committees concerned and the antitrust authorities, says AEG in Frankfurt. However, AEG parent company Daimler-Benz wishes to retain within the group that part of the business that it wants to incorporate into the proposed microelectronics and motor vehicle equipment joint venture between AEG and Deutsche Aerospace AG. AEG has sales of around 200 million German marks [DM] a year and employs 1,700 in this section of its cables division.

Alcatel will be taking over sales worth DM1.7 billion a year, generated by the three AEG cable factories in Moenchengladbach, Duisburg, and Berlin and six subsidiaries with a total of 5,000 employees. For AEG Board Chairman Ernst Georg Stoeckl the sale is an "important policy decision." The investments needed to bring the cables business up to the size necessary in the single European market would have been out of all proportion to the strategic significance of this sector for AEG, the Board emphasizes.

On the other hand, the sale releases resources that will be used for specific growth programs in other fields. This means that AEG's five remaining areas of business will be strengthened. Nothing has been said about the likely purchase price, but AEG is clearly in need of money. At present, talks are also being held for the sale of AEG Olympia Office GmbH in Wilhelmshaven. AEG is known to want to withdraw from office communications. The Wilhelmshaven company's board has resigned because it assumes it will no longer be possible to keep AEG Olympia together as a unit as it had set out to do. The supervisory board is to discuss a plan today to preserve the Olympia brand name, AEG says, and AEG Olympia's new board will also be presented.

The whole of AEG was taken over by Daimler-Benz six years ago, when, following the successful composition settlement nine years ago, it at first appeared that the original company would manage to get back on its feet again. But Daimler's plan to forge a high-tech group has so far failed to get off the ground. It is said that to date Daimler has had to put DM4 billion into AEG without as yet seeing a return on this massive investment. This year there have been significant losses in operational business, albeit less than last year. In 1990 the majority shareholder Daimler absorbed a DM205 million loss. For the year as a whole AEG expects sales to exceed DM14 billion (up eight percent). With AEG Kabel and Olympia, revenue of around DM3 billion is currently up for sale.

Philips Seeks European Partner for LCD Production

92AN0037 Amsterdam *COMPUTERWORLD* in Dutch
23 Oct 91 p 5

[Article by Oscar Kneppers: "No Japanese Partner in Innovative Philips Technology This Time; Philips Wants To Keep Production of LCD's in European Hands"]

[Text] For the development and marketing of innovative technologies, Philips often teams up with a Japanese partner in order to get worldwide support and little headwind in the market. In the past, this was true for the compact disk (Sony) and for the memory chip (Matsushita). More recently, Philips again joined forces with Sony, this time for the manufacture of digital compact cassettes (DCC). This partnership enables the Eindhoven-based electronics manufacturer to take advantage not only of the technological but also of the moral support of its main competitor in this field.

This strategy will not be repeated for the production of liquid crystal displays (LCD's) based on active matrix technology, for which Philips hopes to find partners in Europe. A Philips spokesman announced this preference in an explanatory statement on the plans. Philips attributes the European preference to purely geographical motives. Working with a "nearby" partner is thought to be easier. This implies that the company automatically takes up the gauntlet against Japan, where most LCD screens are made. Initially, Philips will invest 200 million guilders in the plant for active-matrix LCD screens. Once completed, the factory should employ some 450 people. Some of these are already working in a pilot LCD plant, which was built in Eindhoven in 1988. The production equipment will be installed in the former "superchip" factory, which was one of the first factories to shut its doors within the framework of the Centurion streamlining operation. Philips is now going to invest heavily in Eindhoven, the city which was hit hardest by the operation. Within a few years, the factory, in which some 300 people will be employed by the end of 1992, will have to be fully operational. It is projected that eventually some 450 people will be employed in the factory.

As of 1993, the first screens should leave the production line. It is hoped that this will occur in cooperation with another manufacturer. A Philips spokesman explains that the cooperation can take different forms: "Financial participation as well as joint production are possible. We still do not know." However, negotiations with potential partners are already being conducted.

Active Matrix Technology

During the last few years, Philips' nerve center for innovation, Natlab, in cooperation with the pilot factory, put considerable effort into the development of LCD technology. Attention was focused mainly on active matrix technology, in which a diode is assigned to each pixel in the image, thus displaying the changes in the quartz liquid much faster and resulting in a fast-reacting image. This technology is an answer to the frequently heard complaints of passive LCD users. On such displays, the computer user often loses track of his cursor. In addition, the use of graphic interfaces is said to be of little interest, because the image changes are implemented too slowly. The technology that Philips

now wants to introduce puts an end to these shortcomings. According to a spokesman, Philips' LCD technology is so advanced that it produces "remarkably bright and contrasted images." The spokesman refuses to go more deeply into the technology used, except that it is "very easy to manufacture."

Philips intends to manufacture LCD's for various applications. "In addition to the use in (portable) computers, possible applications include dashboard systems and projection TV." The small size of the displays (14 inches) rules out large-scale TV applications for the time being, but thanks to their high resolution, they may eventually find applications in high-definition television (HDTV). "All in all, our studies prove that there is a large market potential," promises the spokesman.

However, Philips' projections are very cautious. For instance, the overall amount of the investment is not specified. The announced investment of 200 million guilders covers only the start-up of production and administration. Having learned from bitter experience, the company also refuses to make any statement about the expected turnover or sales figures.

CORPORATE STRATEGIES

Peugeot Official Compares French, Japanese Automotive Developments

92WS0096D Paris LE MONDE in French 29 Oct 91
p 17

[Interview with Jacques Calvet, chairman of the board of Peugeot SA, in Tokyo: "Jacques Calvet Urges Increased Technology Exchanges With Japan"]

[Text] While visiting Tokyo for the 29th automobile show which opened Saturday 26 October (LE MONDE of 27-28 October), Mr. Jacques Calvet, chairman of the board of Peugeot SA, told LE MONDE he is still against any overall alliance with a Japanese auto builder, but he nevertheless favors more technology exchange....

LE MONDE: What is your opinion of the state of automobile-making in Japan?

Calvet: I was struck by the remarkable variety of chassis—both the outside and the frame—found in the same model. This requires a very flexible industrial plant. On the other hand, in terms of interior decoration (harmony of colors and materials), Japanese builders have not, to my mind, made the hoped-for breakthroughs. In terms of styling, I think European cars are still better.

LE MONDE: What do you think of the cutting-edge technologies exhibited at the Tokyo show?

Calvet: We are all currently pursuing these avenues of research. Japan is only beginning to talk about reducing energy consumption, whereas this is the subject of greatest concern in Europe. The average Japanese automobile still consumes 8.7 liters per 100 km, while its

European counterpart consumes 6.4. Japanese builders are thus lagging behind us, particularly behind Peugeot-Citroen, which leads the field in Europe.

With regard to other innovations, for example electric vehicles, we are at least as advanced. As for all the rest, hydrogen engine, etc., those things are a long way off. The Japanese pay more attention to equipment which we do not deem indispensable, such as these televisions to help people follow a route on a map. Two major trends stand out at this show: a focus on the need to make automobiles more compatible with the environment, and the increasing price-range and diversity of models.

Traditional Alliances

LE MONDE: What about manufacturing?

Calvet: I don't feel too uncomfortable about it. The labor law poses a problem, but in terms of technology level we are moving forward as fast as the best of the Japanese. Because of the difficulty of recruiting young workers and offering them better working conditions, they have been led to automate more, whereas what I would really rather see from them is a reasonable balance between automation and human labor. They also still have reservations about the "just-in-time" (also called "zero stock") system because of flow problems, and they would like to work with the subcontractors of their competitors. The Japanese are on their way to becoming a little closer to the Europeans.

LE MONDE: Given these facts and the "ambiguities" in the automobile accord between Japan and the EEC, what do you think the strategy of the Europeans should be?

Calvet: First of all, we have to know exactly what was decided. For the moment, we are still unclear about this¹. I do not suspect anyone, including the Japanese, of bad faith. We are rivals, obviously, but we talk the same language. For my part, I can only work harder to implement my past policy of improving quality and productivity.

LE MONDE: Do you dismiss any idea of an alliance with a Japanese builder?

Calvet: Yes and no. Yes, with regard to an overall alliance (indeed, we have never had such an alliance with any auto maker in the world). Given the disparities in size, I believe it would do more harm than good. On the other hand, I have a number of traditional arrangements with Fiat and Ford. I am not keen on the Japanese coming to Europe, but if they do, I want European equippers to supply them. For my part, I am ready to do it. We have also had exchanges with Toyota—some 15 technical exchange missions in recent years. These contacts must be increased: There are many domains where we can exchange technologies.

Footnote

1. One of the points of contention about the accord is whether [Japanese] vehicles manufactured locally [i.e.,

in Europe] count against the total number of "Japanese" vehicles sold in Europe. The Europeans, or at least some of them, say yes; the Japanese say no.

Thomson-CSF Outlines Consolidation Strategy

92WS0111A Paris AFP SCIENCES in French
17 Oct 91 p 16

[Article: "Thomson-CSF: Eight Sectors of Development Possible in Civilian Electronics"]

[Text] Paris—Thomson-CSF, the French leader in military electronics, has decided to expand into eight areas of civilian electronics in the years to come. Mr. Alain Gomez, president of the group, made the disclosure on 15 October in connection with an announcement of profit-and-loss figures for the first half of the year.

From a list of 400 possible projects, a group of company researchers and technicians picked eight specific areas of concentration, including environmental control, electronic security, generators and batteries for electric cars, and multimedia technologies. Thomson-CSF is in a position to turn its "technological potential" to advantage in all these relatively undeveloped areas, Mr. Gomez said.

The "Japanese-style" identification of these new areas of activity is consistent with the group's strategy for the future: To build up strength in technologies it has already mastered, but not to diversify into areas "where it lacks know-how."

This "consolidation" strategy should put the group in a good position by mid-decade to profit from an expected "rebound" in military electronics, according to Mr. Gomez. Although Thomson-CSF had predicted the current slowdown in the armaments domain, "we misjudged its severity and scope, since we did not foresee the end of the Cold War."

Nevertheless, "the activity slowdown is not expected to translate into reduced profitability for the group," Mr. Gomez said. "Quite the contrary, because what counts is growth of market share, not growth of the market." The current 6-percent profit ratio (operating surplus/turnover) is expected to increase to 6.5 or even 7 percent in the near future, Mr. Gomez said.

Thomson-CSF showed a profit of 1.12 billion French francs [Fr] in the first half of 1991, a 5.6-percent increase over the first half of 1990. Turnover was Fr16.5 billion, compared to Fr17.3 billion in the corresponding period of 1990. Middle East sales, traditionally accounting for more than 25 percent of turnover, fell below the 20 percent mark, while sales in Europe—which in recent years have represented 10 percent of the total—increased to 16 percent.

Thomson-CSF Official Optimistic, Discuss New Technologies

92WS0078C Paris LE MONDE in French 16 Oct 91
p 19

[Article: "Thomson-CSF Remains Confident About the Future of Its 'Components' Division"]

[Text] Mr. Alain Gomez, CEO of the Thomson group, reckoned Monday, 14 October that the 'Europe of electronic components' was dead following the semi-withdrawal of the Dutch firm Philips from the sector and the announcement of an agreement between Germany's Siemens and America's IBM. But he described himself as fairly "serene" about the future of SGS-Thomson, the subsidiary that is jointly owned by Thomson-CSF and the Italian state holding company IRI. SGS-Thomson is doing "fairly well," in his opinion, considering the "appalling" state of the market.

Yet during the first half of 1991, the company showed a net loss of 356 million French francs [Fr], compared to earnings of Fr12 million for the first six months of 1990. In September the subsidiary's operating statement was balanced again, and should continue to be so over the next few months. To help it, said Mr. Gomez, SGS-Thomson—the last semiconductor manufacturer in Europe—should benefit from the support of the big component consumers: the telecommunications, computer, automobile-electronics, and consumer-electronics industries.

In any event, SGS-Thomson's consolidation should help boost the accounts of its parent company, Thomson-CSF, which must make up for the decline of the military electronics markets by venturing into the civilian realm. Bolstered by a 5.6-percent increase in net half-yearly earnings despite its share of SGS-Thomson's losses (-Fr135 million), Thomson-CSF has earmarked eight sectors for particular development. They include, among others, environmental monitoring, electronic security, generators and chargers for electric cars, and multimedia technologies.

Results of Thomson-CSF Consolidation Analyzed

92AN0058 Paris ELECTRONIQUE INTERNATIONALE
HEBDO in French 17 Oct 91 p 11

[Article by Michel Heurteaux: "Thomson-CSF: Alain Gomez Banks On a 'Rebound' After 1995"]

[Text] Both profits and net margin were up in the first half of the year, but overall sales were down. For the future, Thomson-CSF counts on a world market recovery after the ongoing phase of consolidation.

In a turbulent environment, to say the least, Thomson-CSF is maintaining its course. This emerges from the company's net results for the first half of 1991, which increased by 5.6 percent to 1.125 billion French francs [Fr], compared to Fr1.065 billion for the first half of 1990. This increase is mainly due to an increase in the

current result, which amounted to Fr1.404 billion as against Fr1.368 billion in the corresponding period of the preceding year. Another favorable indicator is the order book, which represented 21 months of sales at the end of June. Nevertheless, these results were counterbalanced by a slowdown in activity during the first six months, which was reflected in a decline in consolidated sales from Fr17.3 billion to Fr16.5 billion in the first half of 1991. Certain sectors are particularly affected, notably the aeronautical equipment sector, where sales decreased by 23 percent, or the missile systems sector (down 13 percent). In the semiconductor sector, SGS-Thomson succeeded in limiting its losses from one half year to the next, notably in terms of operating results (Fr190 million down as compared to Fr178 million during the first half of 1990). Alain Gomez, who presented his group's results to financial analysts on Monday, shows no particular concern about SGS-Thomson's future—at least in public—and even considers that the streamlining work initiated by Pasquale Pistorio could enable the subsidiary to come back into balance in 1992.

Do all these results constitute a chance mishap or are they in keeping with a downtrend in overall demand? Thomson's president appeared rather unruffled about the future, despite less than optimistic forecasts: According to Thomson's own estimates, the growth of the world market for arms, which was 8.5 percent annually from 1980 to 1988, is expected to fall to 1.5 percent for the next few years.

This period of lean years, which Alain Gomez expects to accelerate the "shakeout movement" in the European defense market and to lead to new mergers, should not affect his group. "We feel that in our business we are capable of facing this cyclical decline; we can start on a

growth curve again." To make up for this drop in activity, the Thomson president hopes to develop an expansionist strategy in the traditional fields, without ruling out alliances and acquisitions. He is also convinced that military budget cuts will impinge much less on spending on defense electronics, which takes on greater importance in new-generation weapons systems.

Second "Rebound" Phase

After the current phase, which is based on restructuring and reinforcing the group's potential in its core activities, Alain Gomez expects a second phase of recovery. In the course of that period, which would begin after 1995, the restrengthened group will benefit, according to Alain Gomez's prognosis, from a significant economic boom "in a considerably cleared competitive environment."

Thomson-CSF, "well in line with the ongoing evolution, will be able to put to good use its available skills, some of which could result in the development of new products or systems in the civilian field." Does this mean a greater diversification of the number-one firm in defense electronics? In any case, Thomson-CSF hopes to be present in the new market that will open up in a few years. Alain Gomez also announced the putting in place of a "strategy toward new fields" that will be handled by a working party charged with selecting promising subjects. Eight of some 400 projects studied have already been retained: environmental control, electronic security, civilian C3I systems, computerized equipment for soldiers, hyperfrequency message transfer, multimedia, robotics for hostile environments, and electric vehicles. These eight subjects are considered promising market niches by the year 2000.

Table 1. Trend in Sales Figures by Sector (in billion French francs)

| Sector | First Half 1990 | First Half 1991 | Change (Percent) |
|---|-----------------|-----------------|------------------|
| Aeronautical equipment | 3.730 | 2.860 | -23 |
| Monitoring and control | 2.690 | 3.190 | +19 |
| Detection systems | 3.640 | 3.875 | +6 |
| Data processing systems | 1.000 | 1.080 | +8 |
| Missile systems | 4.080 | 3.550 | -13 |
| Other (including components activities) | 2.220 | 1.945 | -12 |
| Total | 17.360 | 16.500 | -5 |

Of which Fr350 million is from Thomson Broadcast and Thomson Japan

To make up for a particularly sharp decline in activity in certain sectors, Thomson hopes to develop a strategy of expansion in the traditional fields.

| SGS-Thomson: Stabilized Losses | | | |
|--------------------------------|-------|-----------------|-----------------|
| | 1990 | First Half 1990 | First Half 1991 |
| Sales figure | 7.359 | 3.718 | 3.975 |
| Operating result | -544 | -178 | -190 |
| Net financial costs | -357 | -161 | -193 |
| Exceptional result | 452 | 401 | 28 |
| Taxes | -77 | -50 | -1 |
| Net Result | -526 | 12 | -356 |
| Thomson-CSF share | -195 | 7 | -135 |

According to Alain Gomez, SGS-Thomson, which succeeded in limiting its losses, could even come back into balance in 1992.

SGS-Thomson's 1991 Financial Performance Analyzed

Market Share Still Increasing

92AN0061A Paris *ELECTRONIQUE*
INTERNATIONAL HEBDO in French 31 Oct 91 p 8

[Article by Jean-Pierre Della Mussia: "SGS-Thomson Shakes Off Economic Turbulence"]

[Text] Right in the middle of the crisis in the semiconductor industry, SGS-Thomson's financial performance is "better" than that of many of its competitors. However, only an increase in size will be able to save the company in the long term.

Losses of \$96 million in 1990 (after interest and taxes) are "the least negative results of any comparable Western company before interest payments." SGS-Thomson is ranked third in the world in terms of growth since 1983, but only 12th in terms of turnover (\$1.5 billion in 1991): This means that its size is insufficient, explaining its financial fragility. This is how SGS-Thomson looks this year.

As one can imagine, 1991 will not be a year for financial recovery; the low dollar exchange rate has not helped. However, the fourth quarter could see a return to a balanced budget, thanks to the application of a crisis plan aimed at economizing on everything except R&D and investment.

At the end of 1991, SGS-Thomson's personnel will have been reduced by 18 percent, or 3,800 persons (-7.5 percent in France and Italy, but -30 percent in the United States and Great Britain, and -22 percent in Asia and Morocco) and the annual turnover per employee is now up to \$90,000 as compared to \$47,000 in 1987. Manufacturing reorganization is also continuing: The assembly plant in Bristol has been closed; the 4-inch lines have been transferred from Rousset and Catane to Singapore; the Agrate assembly line has been stopped; operations in Dallas have been reduced. The firm is furthermore prepared to accept limited market share losses if the maintenance of its selling prices on nonstrategic products at a minimum level justifies this (off-power [hors puissance] and radio-frequency discrete

components, standard logic circuits, microprocessors with a mature market, and slow static random-access memories (SRAM's)).

Finally, it is continuing to reduce its costs, particularly those related to poor-quality problems, by maintaining investment at 19 percent of turnover: Since 1987, the cost of poor-quality rejects at SGS-Thomson has been reduced from 30 percent of turnover, as in most Western companies, to 23 percent of turnover; however, another 10 points must still be gained to reach the Japanese standard. Investments and R&D expenditure are, for their part, being maintained at 19 percent and 18 percent of turnover, respectively. High-power integrated circuits and discrete components, nonvolatile memories, and a range of dedicated products are among the strategic products for which the company is winning market share and wants to win more in the future. Research also covers the development of priority products, i.e., application-specific circuits, microcontrollers, transputers, high-speed dedicated static random-access memory (RAM's).

Indispensable Alliances

It should be remembered that, in order to ensure sufficient R&D capacity, two centers are to be opened, one as part of the Grenoble 92 program (complementary metal-oxide semiconductors (CMOS) and bipolar CMOS (BI/CMOS) technologies) and the other in Catane, Italy (power technology, architectures, and logic circuits). Among the technologies being studied are a 1.2-micron/700-V BCD III technology, a 4/0.8-micron HFC CMOS technology suitable for signal processing, IGBT's up to 1,500 V, intelligent power up to 1,500 V or 10 A, an XGA graphic interface standard, fuzzy logic, encapsulation, and computer-aided design (CAD).

However, in the long term, SGS-Thomson will need a large-scale alliance, as explained by its CEO Pasquale Pistorio:

"We have limited contacts with Siemens and Philips and we are working with them as part of JESSI [Joint European Submicron Silicon Initiative], which includes work on memories, but this is not enough; we will never be able to reach 5 percent of the world market quickly solely through internal growth. If alliances are possible

between Europeans, we will enter into them. If that is not possible, we will look to American companies. And if nothing is feasible with the West, we will turn to Japan. We do not have a choice, "business is business!" In the short term, our aim is merely to give our shareholders a healthy company with a strong technological base."

Furthermore, SGS-Thomson is entering into numerous alliances with its clients, guaranteeing them technologies and services in exchange for supplying circuits designed for their internal needs (see interview with Pasquale Pistorio on page 5). Thanks to these alliances, among others, the company considers itself the world leader in dedicated telecommunications circuits on the free market, number three in the world for automobile circuits, and Europe's number two in consumer electronics.

Memory Manufacture Indispensable

Like many companies, SGS-Thomson's view is that manufacturing memories is indispensable to the success of its technologies, but Pasquale Pistorio considers that the manufacture of dynamic random-access memories (DRAM's) is no longer as strategic as it was in the past.

"There are three technology drivers: DRAM's, SRAM's, and erasable-programmable read-only memory (EPROM's). Each product has its particular advantages in pushing technology forward; but if the production of both SRAM's and EPROM's has been mastered, it is not absolutely indispensable to be able to manufacture DRAM's. At our level, mass production know-how in the field of EPROM's is quite sufficient. It should be noted that DRAM's are no longer such strategic products as they were three years ago, now that Americans, Koreans, and Europeans are manufacturing them. The production of DRAM's is now therefore nothing more than a financial problem for us, which could be solved by an alliance."

[Box, p 8]

SGS-Thomson Continues To Aim High

As the manufacturer of a wide range of products, SGS-Thomson wishes to reach all sectors of the market in the future, but its aims are very divergent:

- First in the world in telecommunications;
- First in Europe and the United States in consumer goods; number one among non-Japanese manufacturers in the Asia/Pacific region and Japan; emphasis on high-definition television (HDTV) and audio products;
- Number one in automobile circuits in Europe, and among the top three in the United States;
- Number one on the industrial market in Europe;
- Emphasis on computer peripherals and graphics systems;
- Selective defense activities.

Table 1. Major Companies: Market Share Gains or Losses over the 1983-90 Period [Approximate figures derived from graphic]

1. Market share gain (1983 = 100)

| | |
|-------------|-----|
| Samsung | 450 |
| Toshiba | 170 |
| Mitsubishi | 155 |
| SGS-Thomson | 153 |
| Fujitsu | 150 |
| Intel | 144 |
| Siemens | 126 |
| Sanyo | 120 |
| Nec | 120 |
| Hitachi | 110 |

2. Market share loss (1983 = 100)

| | |
|-------------------|----|
| Matsushita | 87 |
| Philips | 77 |
| Motorola | 74 |
| AMD | 50 |
| Texas Instruments | 48 |
| National | 42 |

Caption

SGS-Thomson has greatly increased its market share over eight years, thanks to internal and external growth.

According to SGS-Thomson, the extra turnover generated per dollar invested is \$0.5 in the United States, \$0.6 in Japan and \$0.7 at SGS-Thomson. [Graphic not reproduced]

CEO Interviewed on Strategy

92AN0061B Paris *ELECTRONIQUE*
INTERNATIONAL HEBDO in French 31 Oct 91 p 5

[Interview with Pasquale Pistorio, CEO of SGS-Thomson, by Francoise Grosvalet and Jean-Pierre Della Mussia: "Virtual Vertical Integration Will Save Us"; first paragraph is *ELECTRONIQUE INTERNATIONAL HEBDO* introduction]

[Text] If Europeans take full advantage of possible partnerships with customers, they may be successful, affirms Pasquale Pistorio, CEO of SGS-Thomson.

ELECTRONIQUE INTERNATIONAL HEBDO: There is much talk nowadays about partnerships between semiconductor manufacturers and users. Why now rather than earlier?

Pistorio: The idea is not a new one. It is more often discussed today because we have now entered what I would call the marketing phase, a phase which follows

the two earlier phases in the development of the semiconductor industry: the technology phase and the production science phase. In the first phase, all was to be done; major advances could be made at relatively low cost and technology was the only success factor. During this phase the supremacy of the Americans was clear. However, in the mid-seventies, the volume of production grew and with technological improvements becoming increasingly expensive, we entered the second phase, that of production science. The technology was still essential, but it was also necessary to know how to manufacture in large quantities and at the lowest possible price. It was this production science which made the difference then, and the winners were those who were able not only to have the right technology at the right moment, but also to mass-produce it at the right price and the required quality level. It was during this period that Japanese domination was established. Today, technology and production science are still essential, but they are not enough. Alongside them, it is necessary to develop the components and systems which will use them in order to arrive on the market at the right time. This marketing phase is still open, and this is where the opportunity lies for Europe.

ELECTRONIQUE INTERNATIONAL HEBDO: The services aspect has always been a guideline for semiconductor companies. What is new today?

Pistorio: Manufacturers and users of semiconductors must be partners right from the systems design phase, in order to arrive on the market not only in good time but also with the right product. Customer-supplier relations can no longer be confined to buyer-seller relations. To these alliances the former bring their technologies and the latter their knowledge of the markets.

ELECTRONIQUE INTERNATIONAL HEBDO: How does this notion of partnership work in practice?

Pistorio: At SGS-Thomson, we have entered into some 10 strategic alliances of this type with customers in the telecommunications, consumer electronics, and automobile sectors, to name only the most important. These alliances correspond to approximately 25 percent of our turnover, which is a lot. They allow us to simulate virtual vertical integration, similar to the integration which is the rule in Japan but without the risks inherent in a true marriage, in which the systems manufacturers have a share in the capital of the component suppliers. In the case of real vertical integration, there is a risk for the systems manufacturer, who gets his supplies from a semiconductor manufacturer linked to an equipment manufacturer, of seeing his know-how transferred to the latter. And in the case of a marriage, any separation which proves necessary is all the more difficult.

ELECTRONIQUE INTERNATIONAL HEBDO: Why no more than 10 strategic alliances?

Pistorio: There are two reasons for this: One is inherent in the very nature of SGS-Thomson, the other is more

general. The weakness of our range of dedicated computer products—we do not have any general-purpose DRAM's or microprocessors, nor circuit sets for PC's—partly explains, for example, why Bull and Olivetti are not big customers of ours. This should change in the future. However, it is no longer possible, nor desirable, to have many strategic alliances in all sectors. The type of relationship which we have with Alcatel, Thomson Consumer Electronics (TCE), or Marelli can only be established with companies with which we have learned to work over a number of years and with which a bond of mutual trust has been formed. This is easier to do with intellectually, culturally, and technologically equivalent companies. And this is the opportunity for the West. Western manufacturers are not, in fact, very integrated vertically compared with Japanese manufacturers, and virtual vertical integration thus has every chance of succeeding.

France Telecom President on Debt Reduction Strategies

92AN0025 *Paris ENTREPRISES & TELECOMMUNICATIONS* in French Oct 91 pp 78-81

[Interview with Marcel Roulet, president of France Telecom, by Herve Marchal: "Overall Balance Is a Priority"; first paragraph is ENTREPRISES & TELECOMMUNICATIONS introduction]

[Text] Those fearful of France Telecom getting delusions of grandeur can stop worrying. Its independence has not gone to its head. With a good year behind it, the French national group has one main aim: to rebalance its finances through massive debt reduction. However, it must also turn two strategic gambles into commercial successes. One of them is its digital mobile telephone, which should be no more expensive than Radiocom 2000. The other is business communications, which involves the setting up of truly European networks: sound, serious, and German-style.

ENTREPRISES & TELECOMMUNICATIONS: Talks on the draft contract with the government, a contract which will bind France Telecom for four years, appear more taxing than expected. What is the situation to date and when do you think the contract will be finalized?

Roulet: If all goes well, the draft contract should be submitted to the board of directors during October. It should therefore be signed by the beginning of November at the latest. In regard to the time taken, which to you may appear rather lengthy, let me emphasize two factors. On the one hand, the draft contract is the first ever drawn up for France Telecom. And it is my observation that its preparation has taken place within an entirely new, more deregulated context. On the other hand, there were very important basic problems; the various options had to be examined and positions ratified. Agreement on objectives was reached quickly. However, the various parties did not see eye to eye about how to put them into practice. There was, I believe, a

fairly interesting discussion on finding the right balance between debt reduction, maintaining a real level of investment—and thus, in the long term, the same degree of competitiveness—and the development of our rate structure, our diversification policy—particularly in international terms—and our social policy.

ENTREPRISES & TELECOMMUNICATIONS: Did the government act as a partner or as a regulatory authority in this matter?

Roulet: The government is our regulator, but at the same time it must be our partner. I could not say that it is a shareholder, as we have no capital, but it controls the organization in that it nominates the president and most of the members of the board of directors. However, the government must be responsible for the future of France Telecom. The main difficulty in drawing up this first draft contract has been to ensure that it is what it ought to be and nothing more. From time to time it is mistaken for our work schedule or even for our business plan. I must remind you that the draft contract is the contractual framework within which the government fixes our goals. The draft contract will thus lay down a certain number of parameters in order to determine whether we are achieving these aims. To sum up, it is a question of developing our activities—meaning our sales figures—in sound economic conditions—meaning the profit margin debt level—and increasing customer satisfaction, which is the ultimate aim of our service. Finally, our social policy is aimed at ensuring that these goals are achieved with a satisfied staff which derives benefit from its efforts.

ENTREPRISES & TELECOMMUNICATIONS: Jean-Marie Rausch, the post and telecommunications minister, has just announced that you will invest Fr150 billion over four years. In which fields?

Roulet: This figure is a projection of our current rate of investment with a modest increase in amount each year. As always, most of the money will be spent on our traditional activities, particularly the telephone service. We are going to continue with the digitization of our network; this should be completed in 1995. We will continue setting up a national fiber-optic network. We will improve the quality of service, mainly by extending Numeris [ISDN—French integrated services digital network]. We are devoting considerable resources to mobile telephones, which are part of our “front line.” This is one of the fields where we are completely competitive. Very rapid changes are at hand. We are going to change to digital technology with the deployment of the mobile telephone based on the Special Mobile Group (GSM) standard. Of course, we are going to push on with the cable plan and continue developing videotex. We will increase the diversity of add-on telephone services (of the call forwarding or signaling type). And we will turn our attention to business networks, which represent our second area of competitiveness and strong development. Businesses have international requirements and want increasingly integrated solutions. This is the main reason

for our international policy, which is based on partnership allowing us to follow our customers abroad.

ENTREPRISES & TELECOMMUNICATIONS: British Telecom (BT) has just launched a major offensive in the field of networks for transnational businesses, consisting of setting up a network with the Japanese and Germans. This is aimed at you.

Roulet: In Europe, the interesting and difficult aspect of the relationship between the traditional telecommunications operators bodies is that we are both partners and competitors. We have been partners for a long time and will remain so in the future with, for example, the ongoing introduction of synchronous transmission networks. For us a fundamental requirement is to build a homogeneous European network through a sufficiently close partnership.

However, at the same time we have become competitors in a certain number of fields. BT, which benefits from the presence of headquarters of numerous major firms in the United Kingdom and the importance of the City, quite naturally has ambitions to be the leader in the field of business networks. It thus has projects in this field, Pathfinder being an example. France Telecom feels that it is necessary to move faster toward harmonization than toward competition. We are not against competition. However, it would be absurd not to devote most of our efforts to ensuring that there is first of all an open, homogeneous, and coherent European infrastructure. This is why, with our German counterpart DBP Telekom, we have developed a fairly close partnership, particularly in the field of value-added services through our joint subsidiary Eucom. We believe that answers must be found to the problem of business networks in the form of open solutions which will speed up the creation of truly European networks.

ENTREPRISES & TELECOMMUNICATIONS: From the moment at which agreement is reached according to BT's wishes, what could happen?

Roulet: The important element is IBM's part in this agreement. In any event, alternative solutions are available to us. I often remind people that 75 percent of our international traffic occurs in Europe, speaking in the broad sense. So for us the priority is Europe. Also no single operator can claim to be worldwide. Several partners are needed. Over the next five years such a partnership will probably be set up. For the moment, matters are fairly undecided.

ENTREPRISES & TELECOMMUNICATIONS: One last comment on the subject of BT. France Telecom has been obliged to incur sizable debts. How are you considering dealing with this problem in order to maintain an acceptable level of competitiveness as compared to the other major operators?

Roulet: This is one of the main aims of the future draft contract. It is a question of reducing our financial expenses and giving priority, next year and for the

following 3 years, to reducing our debts in order to bring them down to the debt and financial cost levels of our partners and competitors. Our debt level, of course, is a handicap which would become really serious if allowed to continue beyond 1993. This has been my argument and I think that it has struck home. Whatever our aims may be, restoring our financial position must come first. This is the priority of the draft contract.

ENTREPRISES & TELECOMMUNICATIONS: What is France Telecom's total debt at the moment?

Roulet: Around Fr120 billion. This is too much. It means that debt servicing represents approximately 11 percent of our expenditures. This is why we hope, by the end of the draft contract, to have reduced it to below 7 percent.

ENTREPRISES & TELECOMMUNICATIONS: And meanwhile BT is at what level?

Roulet: A little more than 3 percent. In 1990 it reduced its costs, which were 4.8-4.6 percent, to 3.2 percent. There lies the challenge.

ENTREPRISES & TELECOMMUNICATIONS: Within France Telecom, are the staff, other than higher management, aware of the importance of the draft contract?

Roulet: Completely. Eight years ago we had already discussed what was known as the charter. At that time, I was already struck by the clear thinking of all our staff on the subject of this strategy. The reason was quite simply that it was a question of concepts and ratios which were discussed openly and which, consequently, were familiar to them. I think that the same will apply to the draft contract. Nearly every month I visit a facility and hold discussions with the executives. And I am always very impressed by how well the staff on the spot understand what is at stake.

ENTREPRISES & TELECOMMUNICATIONS: How great a share does research and development (R&D), which is an essential activity in terms of preserving future growth, have in your investment strategy?

Roulet: Our R&D effort will have to represent at least 4 percent of our sales figure. If, as we predict, the latter grows by 7 percent, R&D will grow by the same percentage. We are currently at a good level compared to AT&T, Nippon Telephone and Telegraph (NTT), BT, and Deutsche Telekom. The most difficult thing is to strike the proper balance, within the R&D budget, between short- and long-term R&D. One of the specific features of telecommunications is that the market is technology-led. It is thus necessary to have a good understanding of the technology in order to make the right choices. When, around 20 years ago, France made the right choice in opting for digital systems, it was because, with the National Center for Telecommunications Studies (CNET) it had the resources to give it a clear view and allow reasonable anticipation of the future. Today, with the example of asynchronous time

switching, which will be the basis of very-high-speed switching systems after 1995, it is public knowledge that the concept and CCITT standards were inspired by our research at CNET Lannion.

ENTREPRISES & TELECOMMUNICATIONS: On the subject of mobile telephones, we are waiting impatiently for the GSM system, which will make it possible to telephone all over Europe from a car. Do you already have an idea of the cost and of user rates?

Roulet: GSM is a European standard which does indeed offer the possibility of using one's terminal across national borders. However, mobile telephones are a complicated technology and will remain complicated. When you have 20 million mobile telephones constantly crisscrossing Europe, it must be possible to track a mobile telephone each time it is being called. This requires real-time management of a huge database. A drop in prices will be essentially centered on terminals. I think that we can reckon on a 50-percent decrease over five to seven years in terms of today's currency values.

A very striking feature of countries where mobile telephones are most developed is that, after the initial craze, people expect, for example, a message service enabling you to know, on returning to your car, that you have been called and whom to call. With intelligent networks there will be a profusion of new developments. If you call someone whose line is busy, it would be very practical if by pressing a button the number could be redialed as soon as the other person is free. One can also imagine a service which filters calls; for the next hour, you could indicate the only numbers from which you will accept calls. The main difficulty will be to make progress at user level in simplifying the various operations. What people want is to press one button and nothing more. Or else to have a screen telling them what to do. Much work is still to be done in this respect, and is under way.

ENTREPRISES & TELECOMMUNICATIONS: Will GSM be much more expensive than Radiocom 2000?

Roulet: It should not be more expensive.

ENTREPRISES & TELECOMMUNICATIONS: What about Teletel: Do you find the results satisfactory?

Roulet: We have entered a cruising phase, with practically 75 percent of companies using minitel. We now think that we must optimize the network, with much faster transmission in order to respond to client demand.

ENTREPRISES & TELECOMMUNICATIONS: On this subject, a study by Coopers & Lybrand quoted by COMMUNICATIONS WEEK reports that the overall cost of the operation in the year 2000 will reach \$9 billion. And it does not foresee any return on investment before 1996-98. Can you confirm this?

Roulet: The study that you mention has not yet been completed. However, the order of magnitude of the overall cost is probably correct. It is necessary to keep in mind that in the same period, income from videotex will

also have been considerable: probably near to \$10 billion. To this should be added the very great benefits to the economy: profits to manufacturers, servers, and the government. Since 1989 our annual income has exceeded our expenditure. Not only has Teletel allowed our fellow citizens broader and faster access to the potential benefits of the modern world, it is also an operation through which we have learned much in terms of marketing. On the whole it is a success. It is not by chance that, today, we are world leaders in marketing ISDN (called Numeris in France).

ENTREPRISES & TELECOMMUNICATIONS: Talking of Numeris, what is France Telecom offering to small- and medium-sized companies and manufacturers with this?

Roulet: Numeris is entering into a massive distribution phase. France Telecom is today offering new commercial possibilities with more services, a greater range of terminals (small-size Numeris PABX's), and a more favorable rate structure (a 50-percent decrease in local rates and 10 percent less for long distance). In rental terms our terminals will also cost less; some 20 percent less in the range of Phonis telephones.

Furthermore, France Telecom has just signed a partnership agreement with Metrologie with regard to marketing Teledisquette, a package-based file transfer system. Particularly easy to use and with the advantage of a preferential rate, this product should be very successful with small- and medium-sized companies and manufacturers. Today, having sold more than 100,000 B channels, Numeris is confirming its success.

ENTREPRISES & TELECOMMUNICATIONS: Does France Telecom have an industrial policy? Do you accept that your resources should be used to cover the operating losses of Bull or Thomson?

Roulet: We are aware that, by reason of our size, our position, and the field in which we work, the consequences of our choices (standards, equipment, purchasing policy) go beyond our own interests.

Secondly, we are offering a service. And in the field of telecommunications, services constitute 80 percent of the market, industry 15 percent, and installation and maintenance 5 percent. With companies such as Bull and Thomson, in which we are shareholders, we shoulder the responsibilities of a shareholder but have a partnership to develop as far as services are concerned. For example, we have indicated that we would be reference clients of Bull for its new distributed computing system. With Thomson, this type of scheme can be envisaged in the field of HDTV [high-definition television].

Furthermore, we are trying to meet the requirements of our clients, who want increasingly integrated solutions and we are also attempting to accelerate the development of value-added services (VAS's). Hence, as you have noticed, there have been a certain number of initiatives as regards computer services companies, the

latest being the takeover of SCBF. Why? Because it is active in the banking and financial field, which is a major consumer of telecommunications. We thought it necessary to have a good understanding of that market. Of course, since SCBF was well managed we have kept the existing teams. Our aim is not to manage companies, but that their strategy should match our own.

ENTREPRISES & TELECOMMUNICATIONS: Are you thinking of Cap Gemini?

Roulet: Cap Gemini is a possible partner; it remains to be seen whether this partnership is compatible with the strategy of their new and powerful partner.

ENTREPRISES & TELECOMMUNICATIONS: Is it correct that you had been in contact with Cap Gemini even before Daimler Benz was approached by Cap?

Roulet: That is incorrect. We did not have an opportunity to refuse an offer of partnership at the time of which you are speaking.

ENTREPRISES & TELECOMMUNICATIONS: And since then, have you had any real and serious contact with them?

Roulet: Yes...exploratory contact....

ENTREPRISES & TELECOMMUNICATIONS: You are smiling.

Roulet: No. At France Telecom we always try to take things seriously.

ENTREPRISES & TELECOMMUNICATIONS: Is the dialogue real or false?

Roulet: It is not a false dialogue, but we need precise replies to precise questions in order to be certain that our strategies will be coherent.

ENTREPRISES & TELECOMMUNICATIONS: Does the presence of Daimler Benz bother you much?

Roulet: Not necessarily. However, it would be interesting to know what Daimler Benz's ambitions are in the field of telecommunications services in Europe. I should remind you that Daimler Benz was a contender, along with the American concern Nynex, for operating a mobile telephone communications network in Germany. Daimler Benz is a very reliable, very powerful, and very well managed group, which it is better to have for you than against you. However, if it is potentially our competitor in the long term it is better to know beforehand.

ENTREPRISES & TELECOMMUNICATIONS: And does the government understand this?

Roulet: I think so.

ENTREPRISES & TELECOMMUNICATIONS: In the coming 10 years you want the share of international business in your turnover to be 10 percent. How are you going to achieve this?

Roulet: For France Telecom it is a question of maintaining or increasing competitiveness and diversifying into services in order to capture new market shares. These aims dictate a dynamic policy of expansion abroad, but without forgetting our basic job which is to provide a high-quality public service in France. Achieving 10 percent of our sales figure abroad or via foreign partnerships by the year 2000 is already an ambitious objective, which should be achieved under satisfactory conditions of economic profitability and integration with our overall strategy. Setting a more ambitious goal would, in my opinion, be totally unrealistic right now and, furthermore, there is no major operator today which comes anywhere near this figure of 10 percent.

[Box, p 80]

A Major Group Up Against International Competition

Our national telecommunications operator has just been through an historic year: 1990 saw a change in its status. France Telecom has become a public company with a separate legal personality from that of the government. As if to accompany this milestone, its turnover has exceeded Fr100 billion (to which should be added Fr12 billion from its subsidiaries). And the Numeris network covers the whole of the country—a worldwide first. Below are the other key statistics of a group which is fifth in the world behind NTT, AT&T, DT, and BT, and which must now face up to some tough international competition.

Workforce: 156,615 people (France's sixth biggest employer). Telephone network: 28 million lines. Network: 80 percent digital. Phone cards: More than 100 million sold from the outset (two-thirds of the income from public telephones). International traffic: 75 percent in Europe. Minitel units: 5.6 million. Teletel traffic: 98 million hours connect time, including 20 million for the electronic telephone directory. Mobile telephones: 230,000 subscribers (5 for every 1,000 inhabitants; in Great Britain the figure is 20 for every 1,000). Companies: 49 percent of traffic. Leased lines: Fr5.8 billion, France Telecom's second most important product after the telephone. Fax: Fr4.2 billion. Profits: Fr5.5 billion. (1990 figures; source: France Telecom).

DASA CEO on Joint Ventures, Strategy

92GE0144Y Duesseldorf WIRTSCHAFTSWOCHE
in German 6 Dec 91 p 150, 152-153

[Interview with Juergen Schrempp, CEO of DASA (German Aerospace AG), by Wieland Schmitz and Dieter Schweer; place and date not given: "Not Over Yet: Views on Cooperative Efforts with Japanese. DASA Aims for New Efficiencies by Mid-1992. Risks Remain."]

[Text] WIRTSCHAFTSWOCHE: Herr Schrempp, the third-largest aircraft builder in the world, the McDonnell Douglas Corp., is getting a financially strong partner

from Taiwan. A heavily indebted competitor is thereby attaining new strength and simultaneously transferring know-how to the Far East. Does this trouble you?

Schrempp: No. One had to expect that McDonnell Douglas would link up with a partner. The only thing that surprises me, however, is that it is a Taiwanese enterprise. Otherwise I find nothing fundamentally wrong with ties to the Far East in our branch.

WIRTSCHAFTSWOCHE: Certainly, because you yourself want to cooperate with the Japanese company Mitsubishi Heavy Industries. But the talks have not been successful so far. Will they now be accelerated by the deal between McDonnell Douglas and Taiwan?

Schrempp: The Japanese industrial ministry, MITI, has declared the aeronautical and space industry to be a key area of industrial policy for the future. And the Japanese industry is working full steam to become number one in the world here as well, including with the help of cooperation. Outside pressure is not needed at all there. We must realize that the Japanese have long been working closely with the United States, especially with Boeing. But they want not only to strengthen the axis to the United States but clearly to Europe as well. At my suggestion there are talks with Airbus Industry on cooperation in the possible development of a Jumbo with 600 to 800 seats. As for our own talks with Mitsubishi, they have not been fruitless at all but are on a very good course.

WIRTSCHAFTSWOCHE: With the result that the Europeans are throwing away their lead and helping the Japanese in the development of an aeronautical and space industry?

Schrempp: How is that? Sooner or later Japan is bound to play an important role in aerospace. It is better to develop ties from the start. But we will see to it that there will be a fair give and take.

WIRTSCHAFTSWOCHE: So it will be an embrace instead of a defensive struggle. What specific projects is DASA [German Aerospace AG] negotiating with Mitsubishi?

Schrempp: We are talking about a cooperation on the 100-seat regional jet DAA that we are planning with the French Aerospatiale and the Italian Alenia. That also applies to the corresponding engine that MTU [Motoren- und Turbinen-Union] wants to develop together with Pratt and Whitney. Otherwise it is a matter of future projects such as the supersonic aircraft and the corresponding engines. There the Japanese, Americans, and Europeans are sitting together in the study groups.

WIRTSCHAFTSWOCHE: It is not yet so certain that there will be a regional jet DAA. You only want to build it with state assistance.

Schrempp: We are setting up the program company even before the end of this year and are hoping that we can present a policy decision by the end of the first quarter of

1992 at the latest. And I am thereby very confident that we will receive preliminary financing of the development costs from Bonn. Minister Moellemann confirmed to me that this kind of repayable support is not a subsidy.

WIRTSCHAFTSWOCHE: How many million is it to be?

Schrempp: We accept what was agreed with the United States in Brussels in the scope of GATT. It now appears that for the development costs there could be an agreement in the area of 40 percent.

WIRTSCHAFTSWOCHE: DASA also faces uncertainties in the case of the disputed Fighter 90 and the orders for the helicopters PAH 2 and NH 90. The other arms orders are also shrinking. So is that the end of growth?

Schrempp: Our enterprise faces two difficult years but in the medium term we are growing quite well in all areas except in defense technology. There we are expecting a decline of orders by about 50 percent in the next five years. Our plans assume a positive decision for the European fighter aircraft, EFA, and also the procurement of the helicopters. I see a broad political consensus in Bonn for the necessity of a flexible air defense with one combat aircraft. And there is no rational alternative to the almost fully developed EFA. But sometimes decisions are not rational and that leaves some risk.

WIRTSCHAFTSWOCHE: But truly rational would be the purchase of a less expensive foreign aircraft?

Schrempp: You would be right if this inexpensive solution existed. But so far no one has offered it if one looks at the project in macroeconomic terms. When one also sees, for example, the damage to Germany through a canceled cooperation with our European partners, the loss of technology and skilled jobs and, hence, the lost tax receipts flowing back from the project. That is quite apart from the question of whether a purchased aircraft can be adapted to the mission that was developed for the European fighter aircraft. But I repeat: Security aspects must have absolute priority in the decision and this is where the politicians are called upon. Only then can economic considerations play a role. I assign special importance to this sequence.

WIRTSCHAFTSWOCHE: A further factor of uncertainty is the space area. The ESA [European Space Agency] Conference in Munich did not reach any final decisions.

Schrempp: It resulted in a clear vote in favor of manned and unmanned space operations and the projects are continuing for the time being in the scope of the time extensions—with a growing volume. In addition, our space area will increase greatly with scientific and communications satellites. We will work together with Aerospatiale, Alenia, and Alcatel in this area.

WIRTSCHAFTSWOCHE: But that is not enough to compensate for the decline in military technology?

Schrempp: We do have other business such as engines, civilian aviation, and other new fields. All in all, we are planning for an increase in sales by one-third by 1996, without German Airbus. And not least, Airbus, in which we have a 38-percent participation through Deutsche Airbus GmbH, is doing very well at the moment. Airbus Industry and all of its partners will make clear profits for the first time in 1991. It could be a real problem if one of the major projects were canceled without replacement. We cannot compensate for that. I have repeatedly pointed out this consequence.

WIRTSCHAFTSWOCHE: How large and above all how real will the profit of German Airbus be? After all, is not the Federal Government paying to secure exchange rates?

Schrempp: We are continuing to pay in 1991 but this time we are paying back an appreciable amount for previous support of the Federal Government. The annual surplus of German Airbus, in which all of these payments from and to the Federal Government are reflected, will amount to several hundred million marks.

WIRTSCHAFTSWOCHE: And what is the bottom line for DASA?

Schrempp: In 1991, we will have a positive trade balance for the first time, which we could not achieve in 1990 because of extraordinary burdens. We now face two difficult years, among other things because of the loads for future projects. But then, in the medium term, we will further improve our results. Our restructuring measures have a substantial part in this. We expect an increase in per-capita value creation of about 20 percent.

WIRTSCHAFTSWOCHE: Heretofore the implementation of your structural concept for DASA has failed because of the resistance of the Dornier minority partners.

Schrempp: I believe that in mid-1992 we will have an efficient and operational unit German Aerospace without bothersome company boundaries. We are engaged in very constructive negotiations with the MBB partner Bavaria on an exchange of shares in German Aerospace. So we will have 100 percent of the capital of MBB. We are currently investigating the possibility of fully integrating Telefunken Systemtechnik and MBB into German Aerospace. Our subsidiary MTU is identical with the business sector engines, so all that remains is Dornier, whose activities overlap with those of MBB. But we are pursuing a good course in our talks with the minority partners.

WIRTSCHAFTSWOCHE: Do the Dorniers really agree to a dissolution and integration of their firm?

Schrempp: No. That is not the direction we are going. Rather we are trying to organize Dornier GmbH in such a way that it corresponds to a business sector. Overlapping and the double management structure would then cease and open up very good chances for development.

WIRTSCHAFTSWOCHE: So in the future Dornier, whose chief Werner Heinzmann is responsible for the space operations area on the board of DASA, will be developed into DASA's center for space operations?

Schrempp: It could be space operations, for example, but we are still far from the end of the negotiations. Speculation in this direction does not lead anywhere.

Germany's DASA Expects Streamlining, Reorganization

92MI0055 Bonn *DIE WELT* in German 25 Oct 91 p 15

[Text] Deutsche Aerospace AG (DASA), Munich, where the Stuttgart-based Daimler-Benz group has concentrated its aerospace and defense interests, has some crucial decisions to make. A few months after DASA chief Juergen E. Schrempp presented his new organizational model for the conglomerate made up of Messerschmitt-Boelkow-Blohm (MBB), Dornier, MTU [Motor and Turbine Union], and Telefunken Systems Engineering (TST), the DASA subsidiaries' viability is being questioned. It can by no means be ruled out that the requisite increase in efficiency of the Daimler companies will result in DASA firms MBB and TST being disbanded. The board members were informed of this possibility at their meeting yesterday.

According to the magazine TOP BUSINESS, a total of 400 overhead positions are available as a result of the initial rationalization scheme based on cost reductions. The hardest hit are: 250 top managers at DASA's Munich headquarters, jokingly known within the company as the "ghost house," are moving to Ottobrunn in summer 1992. An apparently logical step, as DASA chief Schrempp has placed the work of his four firms under the newly staked-out divisions of aviation, space, defense and civil systems, and engines.

According to the new organization model, MTU will continue to exist as a single company of its own, largely coinciding with the engine division, although there is some friction with the other DASA firms. The main problem in the plan to wind up MBB, for example, is that the Free State of Bavaria currently holds 17 percent of the share capital, so an agreement has first to be made with the minority shareholder about exchanging it for DASA shares. Bavaria's finance minister Georg von Waldenfels only confirmed talks on this issue yesterday.

Similar integration problems are also emerging in DASA subsidiary Dornier, as the open disagreement with the Dornier family shareholders is currently blocking its planned integration into the DASA organization. Thus the integration plans within DASA might also have a role to play at the Dornier GmbH shareholders' meeting scheduled for next Monday. Yet there are still some high hurdles to be overcome in Dornier's case.

It is known that the recent months had seen a worsening in the dispute between the Dornier GmbH aerospace firm shareholders, Daimler subsidiary DASA as the

majority shareholder (57.5 percent), and the two other shareholders (each with a little over 21.2 percent), Silvius Dornier and the estate of the late professor Claudius Dornier (the latter represented by former agriculture minister Ertl). The minority shareholders (who have a right of veto on important questions), constantly insisted that the existing contracts stipulate that Dornier must remain an independent firm and may not be subjected to asset-stripping.

A glimmer of hope has appeared recently. Not long ago, DASA boss Schrempp said that an agreement had been made to let lawsuits and arbitration proceedings stand for the time being. The important thing now was to worry about Dornier's prospects. There is a lot to worry about, as Dornier is deep in the red.

There are several reasons for the poor state of Dornier's finances: High investments had to be made for the new Do 328 aircraft. Medical technology and the Eifel navigation system ordered by the Bonn defense ministry, and which had to be improved, further increased the pressure.

Altogether, the Daimler-Benz group expects the various cost reduction programs currently under way throughout the group to bring overhead cost savings of 4 billion German marks a year until 1995. The planned efficiency-raising measures will thus focus on DASA companies MBB and TST, as a spokesman for the Daimler subsidiary in Munich confirmed, with DASA set to take control over their operational business in the future. On the other hand, DASA would not confirm that Daimler-Benz is thinking of merging DASA with its fellow subsidiary AEG in the long term.

According to TOP BUSINESS, one scenario is that DASA chief Schrempp takes over as successor to Daimler-Benz chief Eduard Reuter at the beginning of 1996 and that current AEG chief Stueckl would head the merged AEG-DASA firm.

But a DASA spokesman states that: "The only connection that will exist between AEG and DASA is the planned merging the two firms' microelectronics divisions."

Lufthansa Reorganization Far Reaching

92GE0144Z Duesseldorf *WIRTSCHAFTSWOCHE* in German 6 Dec 91 pp 144-145, 148

[Article by Andreas Werb: "Streamline: Tight Cost Management, Aggressive Marketing, and Better Consumer Relations Planned. Layoffs Possible"]

[Text] The notice that the stockholders of the German Lufthansa received once again promised nothing good: To be sure, the state airline reports pretax profits of 172 million German marks [DM] for the third quarter but that is just enough to lower the losses for the current fiscal year, caused by the Gulf war, to DM159 million.

The crane is still sitting on the ground. The growth in international air passenger traffic remained substantially behind expectations. With 2.4 percent, sales did not increase to the same extent as the capacity with 5.5 percent. The seat loading factor, an indicator of fleet utilization, at 61.8 percent was even 4.3 percent below the already weak figure of the previous year. On the bottom line, just as in 1990, a "high operational loss" remains for Chairman of the Board Juergen Weber, who has been in office since September. The only thing that is uncertain is whether the deficit in the hundreds of millions will be compensated through the sale of used aircraft or through the liquidation of secret reserves.

Whatever the arithmetical experiments and balance tricks may be, the sluggish state concern can escape red figures only through a general overhaul. Weber is therefore getting down to the substance: He is planning numerous reforms to reduce the tremendous cost pressure and to prepare Lufthansa for the increased competition in the liberalized environment. The long-term objective is to divide key areas such as freight, passage, equipment, and flight operations into independent profit centers—everything under the cover of a Lufthansa holding company.

If—as expected—the supervisory board approves the new course on 4 December, first of all marketing will be tightened up. The marketing and sales departments, which heretofore have often worked against each other, will be combined and at the same time the freight business will be moved to the new main department passage. It is headed by the previous sales chief Adrian von Doernberg, 39, Weber's right-hand man in the restructuring of the concern.

In the future, the four regional divisions, North Atlantic, Asia/Pacific, Europe, and Germany Sales each with their own sales, controlling, and product and profit management will be under von Doernberg. They will be managed by employees from their own ranks, who must renounce nice-sounding director titles. The heretofore badly neglected tourism branch, most important growth field in airline traffic, reports to Germany Sales. The maxim here as well: Responsibility for results.

But the mere reorganization is not enough. Only a precise allocation of the DM1.7 billion in overhead costs will bring real transparency to the route results. "Until now," says von Doernberg, "everyone muddled along by himself and made his figures look good." The result is that to this day the company managers do not know precisely which routes are being flown efficiently and which are not. "Many heads are still dominated by the automatism of the regulated air traffic market practiced over 25 years, when a Lufthansa ticket practically sold itself," criticizes the former McKinsey [& Company Inc.] man.

That is now over. A system of remuneration based on performance that has now been tested in three pilot projects is supposed to bring the sleepy sales up to

standard. "Properly reserved marketing," formerly appropriate to the self-complacent style of the house, is taboo in the future. The new self-understanding of Lufthansa is being emphasized starting in the spring with an aggressive advertising campaign, including through television for the first time. And the new marketing chief wants to put through a franchise concept, "if necessary with legal steps," against the united opposition of foreign airlines, a concept that makes it possible for Lufthansa to be linked more closely to the travel-agency branch that is responsible for up to 85 percent of sales. He does not even rule out the despised sale by way of wholesalers.

To gain back the lost confidence of customers, von Doernberg is not afraid of drastic measures either. His plan to break the traffic department—responsible for all station and ground services—likewise under him into a customer contact sector and an operational department is equivalent to a revolution within the company. He wants to transfer the squad of technicians who have heretofore dominated traffic and who "never had much to do with the passenger" (von Doernberg) to the board member for equipment, Klaus Nittinger.

Other obsolete bastions are also supposed to fall. Thus the planned splitting of the enterprise serves the objective of providing the individual sectors with competitive cost structures. An example is the—separated from passage—freight, which under chief representative Wilhelmm Althen, 51, is soon being converted into a GmbH in the pattern of the Catering subsidiary, LSG. Over the long term, it can compete against such low-cost offerers as Martinair or Federal Express only when here as elsewhere the concern has differentiated wage agreements to guarantee the competitiveness of Lufthansa.

To be sure, these plans are not very well received by the supervisory board's employee side led by Monika Wulf-Mathies, chief of OeTV [Public Service, Transportation, and Communications Union] but Weber and his executive board colleagues do not by any means want to disturb the existing wage agreements. They have every reason for this.

The quasi-civil servant status of the Lufthansa employees, with automatic salary adjustment and permanence after 15 years, not only hinders performance. It also has in part grotesque results: In Cologne, for example, the enterprise maintains a department called the "social station" in the company's jargon, which serves as a reservoir for dozens of highly paid employees for which the concern has no more use.

Such abuses will gradually be eliminated in the future. A first step is that of making contracts for management employees flexible. And von Doernberg has already let it be heard in internal discussions that quite different traditions must be eradicated: "Departments such as the expensive engineering directorate in Hamburg are just as obsolete in view of the Lufthansa fleet good for a decade as the sponsor of sports or the huge computer center near

Frankfurt." Most of its capacities will now be moved to the controversial Amadeus reservation center in Erding.

[Box, p 145]

Interview: "Dismiss Without Hesitation"

Werb: Herr von Doernberg, Lufthansa is under pressure everywhere: externally primarily in the North Atlantic business and internally through an enormous cost burden. How do you want to make headway there?

von Doernberg: In view of the immovable positions at the political level, the competitive disadvantages relative to the Americans can be compensated only with a partner in cooperation which will make their U.S.inland network available to us. USAir offers ideal preconditions there, although there is a great difference in quality here compared with Lufthansa.

Werb: But how do you plan to gain control over internal costs?

von Doernberg: Our new cost accounting allows us to examine the profitability of all departments. We are moving, in a manner of speaking, from a gut feeling to calculability. That will lead to many painful realizations and adjustments in those areas that do not stand up to a competitive comparison with enterprise units outside of Lufthansa.

Werb: Does that mean that you are excluding some areas?

von Doernberg: We must render uneconomic departments independent and provide them with other cost structures. Not all work, whether in tourism, freight, or equipment, can be produced at a uniform price. In the long term, we are no longer competitive there. The reverse is also true.

Werb: How is that?

von Doernberg: In an international comparison, our cabin personnel, for example, are overpaid, especially in the cockpit. In the case of reservation people and mechanics, on the other hand, we are no longer competitive because our starting salaries are too low. We urgently need more flexible wages and work schedules.

Werb: Is it not more necessary for you to reduce personnel as other airlines are doing?

von Doernberg: Yes it is. In recent years, unfortunately, we had large increases in personnel without a simultaneous improvement of productivity. So as not to endanger the social consensus, we always got by without personnel cuts. But if things really get bad for us, we will not hesitate to dismiss 3,000 or 4,000 people. We do not have to hope for the assistance of the Federal Government.

German Firm Hopes To Stimulate European PC Market With Modular Computer

92WS0064B Duesseldorf VDI NACHRICHTEN
in German 4 Oct 91 p 29

[Article by Egon Schmidt: "Personal Computer Assembled Like Children's Building Blocks"; first paragraph is VDI NACHRICHTEN introduction]

[Text] Munich, VDI-N, 4 Oct 91—A modular construction system will make future updating easier. Tandon hopes for a speedy revival of the personal computer market. Personal computers can now be adapted to the rapid progress of the technology by simply exchanging separate modules for more up-to-date ones without lengthy disassembly of the machine. At the same time, these computers can also be completely assembled individually at the time of purchase.

While up to now it has been scarcely possible or an expensive affair to rebuild a computer into a more up-to-date machine, new personal computers produced by the Frankfurt firm, Tandon, are fundamentally changing this picture. Since "processors, main memory units, floppy disks, and hard disks will be assembled like children's building blocks" with this MCS (Molecular Computer Systems) series PC, Tandon president and founder Sirjan Lal Tandon declared recently in Munich. In Moorpark, California, the head of the company assured us that this great flexibility of the machines with their conventional AT-bus would safeguard "the buyer's investments in computer hardware, software, and training" for a fairly long time to come.

According to Tandon, the performance range of the individual combinable modules with the processors runs from the 286 to Intel's—at the moment not yet available—486 chip with a clock speed of 50 MHz. And with the hard disks, modules with capacities of from 40 MB to 800 MB, which can be replaced by simply pulling them out and plugging the new ones in may be chosen.

These new types of systems should not only offer buyers a high degree of security for the future, the head of the firm went on to say, but should also offer dealers and their businesses noticeable advantages in terms of storage, logistics, and service. This may be more important today than before since "the PC business has become complicated and at Intel alone there are already innumerable different processor models as well as more varied types of memory units and possibilities of combining them."

Tandon expects the modular technology to in future also offer dealers the possibility of "letting individual customers take modules with faster processors or hard disks home for tests." In doing so, the dealer naturally hopes that the customer who tests them will never return these modules, but will instead send him a check.

With regard to the general situation in the personal computer market, the expert said that the situation in the

United States is already improving again since "buyers are increasingly switching from 286 machines to 386 and 486 models." He expects a similar development for Europe in from about 6 months to a year later; meanwhile, his business, at least in Germany, is still stagnating in terms of sales volume and units sold.

The head of the California venture at present places special hope on the new Intel 486X processor, because it offers astounding performance at favorable prices. This is why it may be hoped that it will get buyers to switch more rapidly from the 386 to the world of the state-of-the-art 486.

As reported by business manager Rudi Arndt, with about 81 million German marks [DM] in the first semester of 1991, in Germany Tandon racked up practically the same sales volume as during the same period last year. The same also applies to the number of pieces of equipment that were sold. Whereas a profit of 12 percent on sales amounting to DM180 million was recorded for all of 1990.

The PC manager expects a new upturn with the MCS series, which now still consists of new Risc workstations based on a 64-bit Sparc processor made by Panasonic. The MCS series, just as the rest of the new PC series models, are equipped with compact, easily replaceable hard disk drives that provide improved performance.

Trends in Biotechnology Industry Assessed

92MI0038 Duesseldorf *HANDELSBLATT* in German
18-19 Oct 91 p 25

[Article by Peter Malinowsky and Gregor Wick: "Hope for Profitable Growth Remains, Despite Disappointments"]

[Text] The effects of biotechnological disciplines are spreading to an increasing number of market sectors. Nevertheless, the high expectations of commercial biotechnology are taking longer than forecast to come to fruition.

This strongly segmented cross-sector technology, which affects a wide range of areas, has had the greatest impact on the pharmaceutical industry, which will also show the highest revenues and profits over the next five years. Revenues from biotechnological products will be far smaller in environmental technologies, agriculture, and the food industry. The impact of biotechnology will nevertheless broaden significantly, affecting many sectors.

The pharmaceutical industry benefits primarily from the greater importance attached to the properties of products and to ethical considerations than to considerations of cost. This is shown by the enormous amount of research devoted to effectively combating hitherto incurable diseases such as cancer and AIDS.

In the cost-sensitive agriculture and food industry sectors, where investment decisions are dominated by cost-benefit considerations, prospects for the commercial exploitation of biotechnological innovations remain doubtful.

In terms of structure and decision-making criteria, the third group of industries occupies a position between the first two. It comprises environmental technologies, where political and public pressures prevail over purely commercial considerations, and the area of specialty chemicals, where productivity and output are all-important.

There are various obstacles that may adversely affect the success of biotechnological products to a greater or lesser extent. Whereas technological obstacles can be overcome sooner or later, market and legal difficulties are frequent causes of failure in the commercial exploitation of biotechnological developments. High development costs in proportion to market potential and company profits are another obstacle.

Reasons for a product's failure to meet sales targets include not only its premature or late market launch but also its simple failure to satisfy market requirements.

The legal framework, the authorities' lack of familiarity with the licensing procedures, and public rights of objection are all crucial to the nature of biotechnological or genetic engineering plants and the timing of their entry into service. Thus it is hardly surprising that in view of the legal uncertainties prevailing until 1990, of the 13 drugs produced by genetic engineering processes to be marketed worldwide, only one was produced in Germany.

As biotechnology is not yet a separate industrial sector but rather a set of processes with many applications, biotechnological processes are frequently in competition with conventional ones. In many cases, only partial stages of production are replaced by genetic engineering processes. Though biotechnological processes can readily be introduced into new areas, innovations continue to be achieved quickly, safely, and cost-effectively with conventional technologies in a large part of industry.

Pharmaceutical Products Show Promise

Though companies hope their high R&D expenditure will open up profitable markets, research is designed purely to maintain their technological competitiveness. This principle underlies even the biotechnology research undertaken by the leading European chemical and pharmaceutical companies who want to maintain their grasp of pacemaking technologies.

The real scope for biotechnology lies, then, in individual market and technology niches, which have to be systematically sought out. Biotechnology will not be a homogeneous discipline for some time yet.

Worldwide sales of bio-pharmaceutical products amounted to \$1.9 billion in 1990 and will increase by around 26 percent a year to 1995. Although patent disputes, lengthy licensing procedures, and unpredictable investor trends affect market development, their importance in diagnosis and treatment will continue to grow. This can be seen from the steady growth in R&D expenditure by the 20 leading pharmaceutical companies, which amounted to some \$8 billion in 1990. Despite the very long development time, averaging eight to 10 years, for a preparation produced by genetic engineering, there is a steady growth in the number of biocatalysts at the clinical trial stage or pending licensing.

While the five pharmaceuticals that generate most revenue accounted for some \$1.4 billion in annual world sales in 1990, they will account for around \$2.3 billion in 1995.

With an annual growth rate of 22 percent in Europe between 1990 and 1995 (compared with 4.1 percent annual growth for all prescribable drugs), pharmaceuticals produced by biotechnology will continue to show the pharmaceutical industry's greatest rate of growth. This potential has also been recognized by the major multinational pharmaceutical companies, a succession of strategic alliances between European and American companies being the result.

Over the next few years, more European firms are expected to follow the example of the Swiss Hoffmann-LaRoche company, which in February 1990 acquired a majority stake in the American firm Genentech to gain biotechnological know-how as a means of reducing the lead still enjoyed by American and Japanese firms.

Large-scale company takeovers by established American and Japanese chemical firms seem less likely, as they already possess adequate in-house expertise to develop new genetic engineering products.

New approaches are particularly needed to solve environmental problems where ever-increasing quantities of waste and sewage, in addition to the growing threat from long-standing polluted sites, call for efficient, environment-compatible technologies. The scope for using modern biotechnology in environmental applications is, however, distinctly limited. This large growth market requires complex microorganism cultures for use in converting even more complex mixtures of substances.

Future know-how will continue to focus on utilizing mixed cultures for the targeted conversion of specific substances at minimum cost. Examples include *in situ* reclamation of polluted sites, ground water purification, domestic waste degradation, and special industrial effluent purification; these will be markets that can be served mainly by small and medium-sized enterprises. Larger markets will develop abroad, though only in five to 10 years.

Biotechnological applications for plant protection range from pesticides produced by microbial processes to trans-geneous [transgen] plants resistant to insects and viruses. The success of new plant protection agents based on biotechnological production processes depends to a large extent on their ability to compete in terms of cost with conventional chemical plant protection agents.

In contrast to applications of modern biotechnology in the pharmaceutical industry, the boom expected in other industrial sectors has so far failed to materialize. Estimates of the market for biotechnology in agriculture, environmental protection, and food technology (up to \$90 billion by the year 2000) are certainly still optimistic, though it remains to be seen when, for example, plants resistant to pests, pesticides, heat, and cold will become a reality.

Scope for Development in Agriculture

An analysis of the number of foreign patent applications in modern biotechnology in recent years shows that applications for plant mutations are ahead of all other areas of research, which means that during the next few years companies will still have sufficient potential "market successes" for agricultural applications of modern biotechnology in their development pipelines.

Such developments can only be successful, however, if they make for definite increases in production, cost savings, or improvements in environmental protection or safety at work. In view of the western world's surpluses of agricultural products, no market growth comparable with that forecast in the pharmaceutical sector can be expected in the near future.

Despite the present cost disadvantages, the positive aspects of biotechnological products are increasing in the light of growing public disapproval of chemical plant protection agents. If the next five years should come to see these positive aspects outweighing the cost disadvantages, an annual market worth \$200 to 400 million can be expected.

EAST-WEST RELATIONS

Siemens, Skoda Set Up Joint Venture in Energy

92P60087 Duesseldorf *HANDELSBLATT in German*
27 Nov 91 p 26

[Text]The Siemens division of KWU has agreed in principle with the Skoda company of Plzen A.S. and Skoda Praha A.S. to establish a joint venture for the entire field of energy generation. Such an agreement was signed in Plzen, but it still requires the approval of the government of the Czech republic. The planned joint venture intends to offer fossil fuel and nuclear power plants, hydroelectric generators and also modern environmental protection technology for power plants and waste disposal facilities. Thus it will furnish a complete spectrum of products, from development and planning to the delivery of turnkey operations.

The working name for the new company is Skoda Energy. Skoda will take 33 percent of the capital and Siemens/KWU will take 67 percent. According to information from Munich, the share which Siemens will take will also provide for participation by the French reactor manufacturer Framatome, with whom Siemens/KWU has been cooperating in reactor construction since 1989.

From this cooperation, Skoda is hoping for assistance in the task of bringing the northern Bohemian power plants up to the necessary level of environmental technology and in other urgent environmental problems of the CSFR.

Siemens was chosen as the strategic partner for developing the energy business, it is said, because the company, along with Framatome, provides the best qualifications for power plant business on the world class level in the area of nuclear equipment. For Siemens, the cooperation with Skoda is a considerable increase of its involvement in energy technology, not only in Central and East Europe. With this "solid partner" one can tackle larger deals on the world market. During many years of business dealings, one has become convinced of the high technological level of Skoda and the qualifications of its employees, it is said. The predominant share of the management for the joint venture will come from Skoda. The installations and funds to be supplied, as well as the number of personnel, are to be regulated in the coming months. Skoda Plzen was founded in 1859 and is one of the world's most important manufacturers of power plants. The company has a leading position in East Europe in the construction of both conventional and nuclear power plants. Over 7000 persons are employed in Plzen and Prague in the area of energy production.

Germany's Role in Hungarian Foreign Trade Discussed

92MI0079 Duesseldorf *HANDELSBLATT* in German
31 Oct 91 p 8

[Text] Germany already accounts for a quarter of Hungarian exports, and the number of joint ventures has also risen further.

Hungary's transition to market economy-led privatization and the establishment of thousands of new firms has led to a substantial rise in the number of Hungarian trading partners. This gives special importance to the various delegations that chambers of industry and trade and certain laender and German banks have recently set up in Hungary.

These include the Delegation of German Industry to Hungary. Eva Dude, the economist who heads the German Industry Bureau in Budapest, says: "Our Budapest office was officially opened on 6 March 1991, as a springboard for German and Hungarian companies, and as the preliminary stage of a German-Hungarian Chamber of Foreign Trade; its purpose is to bring about

a growth in business links between German and Hungarian companies through a wide range of information and consultancy services, and to promote a series of organized events and functions."

The BNP-KH-Dresdner Bank AG, which is jointly owned by the Banque Nationale de Paris, the Handelsbank AG Budapest, and the Dresdner Bank, had its official opening on 30 October. The Dresdner Bank AG has also had an office in Budapest since 1990, the main focus of whose work will now be to provide information on investment opportunities.

The number of companies set up jointly by or with German firms in Hungary already exceeds 2,000, the total of German direct investment in Hungary being in the range of \$300-400 million. It is stressed that, during the 18 months since it set up in Budapest, the Dresdner Bank's office has had talks with several hundred German firms. This investment by the Dresdner Bank is the fourth by a German bank in Hungary.

Local Representation Promoting Specific Sectors

The German economy's presence in Hungary has also been heightened by the opening of the Land of Baden-Wuerttemberg delegation: Baden-Wuerttemberg industry's interests in Hungary focus primarily on mechanical engineering and automobile manufacturing.

For example, a Kirchheim engineering firm recently acquired a majority stake in the machine tool factory belonging to the Budapest company Danube-Island Csepel, having been attracted by the company's highly-skilled workforce and the fact that 30 percent of its output was already exported to western Europe, a percentage that is expected to rise in the near future.

Baden-Wuerttemberg businessmen expect the investments in Hungary by Opel and the Japanese Suzuki company greatly to increase Hungarian suppliers' capacity to provide semifinished components for cars.

The Rhineland-Palatinate Minister of Trade, Rainer Bruederle, stated during an interview in Budapest that firms showing for the first or second time at the Budapest International Trade Fair would have half their expenses refunded; this shows that interest in Hungary as a trading partner is growing even in the laender that are geographically further from Hungary than, say, Bavaria or Baden-Wuerttemberg.

Siemens was among the first to establish a jointly-owned company in Hungary back in 1974 when joint ventures were first allowed, while since 1990 Siemens Ltd. Budapest has been 100-percent owned by the parent company with a common stock capital of 25 million German marks [DM].

Siemens Telephone Factory Ltd., with a common stock capital of DM50 million and a 76-percent German stake, is expected to play a major role in the extension and modernization of Hungary's telephone network. Other major German companies present in Hungary in some shape or form include Daimler Benz, Hoechst, Mannesmann, Krupp, Thyssen, and Bertelsmann.

EUROPE-ASIA RELATIONS

German Government Promotes Investment in Japan

92MI0089 Duesseldorf *HANDELSBLATT* in German
4 Nov 91 p 8

[Text] Only a few German firms have so far succeeded in gaining a foothold in the Japanese market. In the past, trade and investment barriers made a successful start in the Far East difficult. Now the trend is to be reversed with a government support program.

"Our Japanese friends have understood that they must open their country to prospective foreign investors," German-Japanese Industrial Business Association Chairman Arno Mock told businessmen in Duesseldorf, where representatives of industry and government were reporting on new opportunities for investing in Japan at a symposium backed by the Japanese Industry Ministry (MITI).

The Japanese are showing enormous surpluses in direct investments, just as they are in trade. Last year alone, \$14.3 billion flowed into Europe from Japan. The transfer in the other direction was only \$1.4 billion. Hartmut Krebs, State Secretary in North Rhine-Westphalia's Ministry of Economic Affairs, said that the main reasons for this imbalance were the high initial costs of investing in Japan and the difficulties in recruiting staff.

Both these factors could be avoided by a judicious choice of location, Hiroyuki Watanabe of the Japan Regional Development Corp. explained: "Foreign investors concentrate far too much on conurbations such as Tokyo and Osaka." If more businesses opted for a rural location, their start-up costs could be greatly reduced. Industrial sites in Kyusyu or Hokkaido, for example, cost only one-fifth of comparable land in a large city. Since Japan's universities were scattered throughout the country, well-trained technicians could also be recruited more easily in these regions. Wage levels were about 20 percent below those current in Tokyo.

Hiroshi Tsuda of the Japanese Industry Ministry urged German firms to make use of the state support mechanisms: "For locations in rural areas we offer special tax incentives, low-interest credits, subsidies for the purchase of industrial sites, and additional depreciation facilities for buildings and machinery." The first success stories were already being written. For example, a recently published survey by the American Chamber of Industry and Commerce showed that 55 percent of all U.S. firms questioned considered the Japanese investment climate favorable.

Dieter Schneidewind, a director of Wella AG and active in the Far East on his company's behalf since the 1960's, agreed with this appraisal: "I know of no industry that can afford not to enter this market in the long term." In this connection, Schneidewind criticized the one-sided commitment to eastern Europe: "Of course we must

invest there now. But at the same time we must not make the mistake of neglecting the markets in the Far East." Schneidewind was particularly enthusiastic about the Japanese authorities' willingness to cooperate: "What makes Japan so attractive is the extremely short authorization procedures. Anyone wanting to build a new factory in Germany has to allow 72 months for it, all things considered. In Japan the same can be achieved in only 22 months."

Japanese Microelectronics Firm Seeks European Expansion

92MI0161 Bonn *DIE WELT* in German 2 Dec 91 p 11

[Text] "Our first objective is to lead the world in components technology, with microelectronics at the core, and to lead the field in Japan in the development of automation systems." This is how Toshihiro Kiribuchi, chief executive of the Omron Corporation, Kyoto, describes the aims of his company, which is seeking to increase its exports from their present 18 percent to 30 percent over the next few years.

The firm has built up an extensive network of branches and subsidiaries outside Japan. In Europe it has two production centers, in England and the Netherlands, and 21 marketing branches. This year it added branches in the Soviet Union, Poland, Czechoslovakia, and Hungary and a subsidiary in China.

The Omron Group's sales income breaks down as follows: Japan 82 percent, Europe 10 percent, America 6 percent, and Asia/Pacific 2 percent. The group has a total of 17,442 employees worldwide. In Europe it has 1,300 employees in four divisions. Systems and components for production automation account for 71 percent of European sales, terminals for electronic payments 23 percent, office automation 5 percent, and medical technology 1 percent.

In the 1991/92 fiscal year, Omron expects sales to reach 610 million German marks [DM] in Europe, an increase of 13 percent. "Germany is our most important market in Europe, but also the most difficult because our competitors are highly specialized," says Omron's public relations director Kazuhiro Takahashi. The company works with Siemens and Telekom in Germany, where it also has three large branches.

Sales were up by a respectable 10 percent to DM86 million in fiscal year 1990/91, and net profits were DM2.7 million, following a loss the previous year. For the six months April-September 1991, the Omron Group reported a 6.3-percent increase in sales to 190 billion yen [Y] (DM2.4 billion) as a result of good sales of labor-saving devices and systems, but a 16-percent drop in net profits to Y6.5 billion as a result of high research and development expenditure and special depreciation allowances.

Omron leads the Japanese market in several fields. For example, the company has a 70-percent market share in switches, 68 percent in power relays, 64 percent in timers, and 52 percent in sensors. The firm is one of the major suppliers of systems for electronic cash transactions, with automatic ticket vending machines (39 percent), automatic teller machines (26 percent), and checkout scanners (20 percent). In health care Omron is the world market leader for sphygmomanometers and electronic clinical thermometers. The company is also among the leaders in "fuzzy technology," a new form of process control. In January next year Omron intends to bring workstations operating with this technology on to the market. The firm has also developed a digital fuzzy chip with a very high processing speed.

In the 1990/91 fiscal year the group's capital investments amounted to Y54 billion, about 11.6 percent of sales. Research and development expenditure increased 22 percent to Y30 billion, just short of 7 percent of sales. Research focuses mainly on five areas, which, apart from fuzzy technology, include micromotorization and biosensor research.

Mitsubishi, Daimler Agree on Semiconductor Project

92P60059A Munich *SUEDDEUTSCHE ZEITUNG* in German 13 Nov 91 p 36

[Text] In all likelihood, Daimler-Benz and Mitsubishi have reached a second agreement during their persistent talks on possibility of cooperation. After Daimler-Benz's affiliate Mercedes-Benz, which can rely on the aid of Mitsubishi Motors Corp. to sell its cars in Japan, it is now apparently the turn of AEG (General Electric Society). A spokesperson of the anemic Daimler subsidiary declined to deny that Mitsubishi Electric Corp. and AEG will sign a contract this year on a joint semiconductor project and that production will begin in 1992.

According to these plans, the AEG subsidiary Telefunken electronic GmbH (TEG) will produce a "bipolar semiconductor for analog signals", such as those used in devices of consumer electronics. The Japanese company intends to sell the electronic component under its own brand name on the European market. The entire business "is of small size", said the AEG spokesperson, and TEG also makes electronic semiconductors "for others." The Japanese economic newspaper *NIHON KEIZAI SHIMBUN* was somewhat more specific and stated that the cooperation would amount to a sales volume of "several hundreds of millions of yen," which however would only be several million German marks.

The advantages for both sides of a joint venture are self-evident. AEG gains access to new know-how. Mitsubishi Electric uses this second sourcing to obtain better access to the European market via AEG as an electronic Trojan horse. And perhaps there will be more movement in the talks between the two concerns on cooperation in railroad technology and household appliances, especially refrigerators and freezers.

But this still does not establish a "strategic alliance" which Daimler chief Edzard Reuter likes to talk about. Even after three summit meetings of the top managers, the really large projects are still waiting; such as, for example, developing a joint terrain vehicle, or cooperation in airplane manufacturing and in space and missile technology, or even the construction of an automobile factory in Russia, as the Soviets wanted when they had fewer problems than they do now.

Bull Sells Smart-Card Technology to Japan's Oki

92WS0062C Paris *AFP SCIENCES* in French 3 Oct 91 p 23

[Article: "Bull CP8 (Smart Cards) Signs Licensing Agreement with Oki"]

[Text] Paris—Bull CP8, the Bull group subsidiary specializing in research and development of smart cards, has just sold Japan's Oki a license to use its patented smart-card microprocessor technology, according to a 26 September news release from the company.

The licensing agreement for the SPOM patent allows Oki to produce integrated circuits based on the unique smart-card microprocessor architecture. The components will be marketed in Japan by SPOM Japan, a joint subsidiary of Bull CP8 and Dai Nippon Printing.

The technology described in the SPOM patent has been responsible for numerous microcomputer card applications including payment systems, portable files, pay television, access control and data security.

Davignon on Fujitsu's Strategy in Europe

92AN0026 Paris *ENTREPRISES & TELECOMMUNICATIONS* in French Oct 91 pp 84-85

[Interview with Etienne Davignon, former EC Commission vice president, by Herve Marchal on the occasion of his joining ICL's Board of Directors: "The Real Question: Will the Japanese Remain Insular?"; first paragraph is *ENTREPRISES & TELECOMMUNICATIONS* introduction]

[Text] When he joined the Board of Directors of ICL, the British computer manufacturer taken over by the Japanese Fujitsu company, tongues were set wagging: Is Viscount Etienne Davignon not the former vice president of the Brussels-based EC Commission who is very dedicated to building Europe? Why then has he crossed the Rubicon? What are his views about the second-largest computer manufacturer in the world? Is Europe condemned to suffer the Japanese offensive? Answers below.

ENTREPRISES & TELECOMMUNICATIONS: My first question concerns you personally. How can one of the symbols of European construction, a former vice president of the EC Commission, become adviser to the

Japanese Fujitsu company which has become the world's number two in computers with the purchase of the British ICL?

Davignon: One has to be consistent in his thinking. For instance, I never believed that it was wise to transpose the theory of national champions, that I have always opposed vigorously, to the EC level. You know, during my stay at the Commission I saw the wasting of iron and steel funds; I saw the maintenance of walls in telecommunications for a longer period of time than was reasonable.

So there are people who say: Let us create European national champions and the matter will be resolved. Well, I am also opposed to that theory because you have to see if the conditions exist! Examples: The automobile industry is a European industry. It admittedly is having difficulties, but in my opinion these can be surmounted. This industry was not created by government decree. Fiat, Volkswagen, Peugeot, and Renault are not trying to have a European and world outlook by decree. They have that outlook because it is the law of their industry. In the field of telecommunications, the merger between CIT and the former European companies of ITT was an excellent decision. By the way, I was involved in that at one time, but it was not ordered by decree. And today, Alcatel is a full player at the world level and so is Siemens. Of course, one must ensure that conditions for development and competitive capacity exist for these companies in respect to their main foreign, U.S., and Japanese competitors.

The second point is that principled objections always appear to me to be a mistake and a stupid approach when one wishes to participate in what is a worldwide activity in products or services of this kind. When I look at what happened in the past, I note that the fact of not having adopted an attitude of principled objections against the United States was a good thing for Europe.

ENTREPRISES & TELECOMMUNICATIONS: Nevertheless, there is considerable predominance of the Americans in Europe in the computer sector.

Davignon: That is clear. But that is the price for what we were not able to do. Everybody started more or less at the same time. It is interesting to see that Fujitsu only got involved seriously in this field after the war and that it has now become the number two worldwide. I will not say that the Japanese structure did not help, but why could the European structure not help the Europeans in the same manner? What we tried to do was for each to have his own IBM. By trying to create several IBM's, none at all was created; and since there was not really an open market, our own forces did not have a development capacity similar to that of U.S. manufacturers.

ENTREPRISES & TELECOMMUNICATIONS: Let us go back to the Japanese.

Davignon: The real question is not whether we will throw the Japanese into the sea; in the final analysis, the real

question is whether the Japanese will become players who will act and define their strategy by aligning themselves roughly with the major world players or whether they will decide to remain insular.

In any case, they have by now become too strong to be thrown into the sea. I am quite ready to be called a traitor for saying so. In fact, I think that adopting a strategy for which one does not have the resources is accentuating the defeat one will suffer.

The discussion must focus on how we tell one or the other major Japanese company: You are now a world player and that obliges you to modify your behavior structures, which may have been appropriate in your culture but which no longer work. That is the adjustment you have to make.

ENTREPRISES & TELECOMMUNICATIONS: So why the Fujitsu bet?

Davignon: Fujitsu says: "We do not just want to become a Japanese company working throughout the world, but a worldwide company with all the consequences that it implies." Well, I think it is stupid not to go see if they mean it! And if they do not, draw the consequences with great calm because...if ever somebody tells you that I have lost my independence, please take me at my word that this cannot possibly be true. Does this mean that we have to say amen just because the Japanese are strong? Of course not. We have to be extremely vigilant, but in an interactive context, not in a context of rejection.

You know, all that determinism which inspires Mrs. Cresson's [French prime minister] rhetoric really concerns me because it is depressing and weak to make an analysis and then not try to stimulate the possible changes; but to go from there and say that we are not in a cooperative structure, with our eyes open and everybody minding his own interests, that appears to me to be a mistake.

ENTREPRISES & TELECOMMUNICATIONS: How far do you think you can go in the advice you will give Fujitsu?

Davignon: I must be very clear: This is a completely secondary activity that will take, at the most, three to four days of my time per year.

ENTREPRISES & TELECOMMUNICATIONS: And the Japanese, what do they expect from you?

Davignon: What is left when you remove the dressing? There is no ambiguity about the fact that I am not an accommodating partner with respect to the Japanese. Neither accommodating, nor hostile. Next, I am independent in regard to them. Finally, they tell themselves that the analysis I provide on what they should do to be accepted in Europe is worth something.

I believe they have understood that if it is just a question for them of being able to identify with the name Davignon to justify their actions, things cannot work.

ENTREPRISES & TELECOMMUNICATIONS: How long did you negotiate with Fujitsu before you came to an agreement?

Davignon: About 1 and ½ years. Not every day, of course. But from the moment that they asked me the question—of course, they did not ask directly—to the moment that an agreement was reached, took 1 and ½ years.

ENTREPRISES & TELECOMMUNICATIONS: What do you think of Fujitsu as industrial player? What are its strong points?

Davignon: Fujitsu's progress indicates that they were not wrong. If they had been wrong, they could not have progressed the way they have even in Japan, or in a world where IBM exists, or in relation to the other activities of other Japanese computer companies. So, they possess a very high technical quality.

But due to the critical eye with which they view their work, they are also in a better position to anticipate the major change in computer science that we are experiencing. This Fujitsu strategy of offering extremely high-capacity equipment which at the same time is accessible by the largest possible number of people is, of course, what everybody is trying to do. No client today will buy anything that is not "multiserver," as they say in the jargon. You no longer wish to be a prisoner of the infrastructure you have installed. This means that services, software, and maintenance have become the keys. And I believe that the Japanese are very often better in these fields because of the regard they have for their own work.

ENTREPRISES & TELECOMMUNICATIONS: Can Fujitsu's current position not also be explained by the long-term view that all Japanese companies have?

Davignon: If you look at what Fujitsu's shareholders have earned during this period, you will note that they really earned peanuts as far as dividends are concerned. However, they have made a nice bundle in capital. I believe that the Fujitsu managers now realize that they were not enough globally oriented and that they risked paying insufficient attention to the customers' needs. And customers are different from country to country. The managers thus think about what it means to have a global strategy. And they are very perplexed.

ENTREPRISES & TELECOMMUNICATIONS: Does the purchase of Fulcrum from British Telecom mean that Fujitsu wants to become a manufacturer of telecommunications equipment?

Davignon: The costs of developing new exchanges or introducing a new switchboard are so high that it is difficult to imagine new players against those already in existence who have a very strong position. It is also true that the success of a switching system nowadays depends on the software. So, will new alliances be found in the development of such software? We will see. In any case,

the software manufacturers need to have sufficient knowledge of hardware technology so that they know what problems have to be solved. Inversely, large capacities will be found among the major telecom companies. But the integration of computer science in many activities, including industrial ones, means that the borderlines are no longer as clear-cut as in the past. This is one of the main questions for European industry: If you do not maintain sufficient manufacturing capacity, you are no longer capable of anticipating the need which will be felt tomorrow.

ENTREPRISES & TELECOMMUNICATIONS: ICL participated in major European research projects. What will become of these projects, now that the company has come under Japanese control?

Davignon: It is clear that I will not become lobbyist for Fujitsu or ICL at the Commission. In fact, this boils down to an important question. Is it worth being deprived of a certain number of players in programs where the rules are known and the obligations precise? Reciprocity is the sole criterion. European companies in the same situation in Japan must have access to comparable programs. We thus have to be vigilant.

Philips, Sony Share Audio Technology Patents

92AN0018 Antwerp *DE FINANCIËLE-
EKONOMISCHE TIJD* in Dutch 10 Oct 91 p 1

[Article: "Japanese Willing To Support Digital Cassette—Philips Gives Go-Ahead to Sony's Minidisk"]

[Text] Eindhoven/Tokyo—Philips has pooled its patents regarding the MD (minidisk) with those of Sony, so that from now on licenses can be given to third parties. Sony for its part is willing to help the Dutch electronics group with the introduction of its DCC (digital compact cassette). Whether or not the Japanese are actually going to take a license on DCC is not quite clear yet. This cooperation could lead to the commercial breakthrough of both the digital cassette and the mini-CD and constitute a new step forward in the audio era.

Sony is going to give its full support to the introduction of Philips' DCC, while Philips will place its patents in the field of CD technology in a common pool with Sony. This was announced yesterday by both electronics giants. Sony needs the patents in order to launch the MD. This is a small, recordable CD. Sony had previously attempted to introduce the digital audio tape (DAT) as a successor of the traditional music cassette. But this proved to be a commercial failure, because there was insufficient response from the music industry.

A Philips spokeswoman stated that the granting of patents for CD technology does not imply that the Eindhoven-based company has now pinned its faith on MD. "The minidisk still lacks sufficient support from the software industry, whereas for DCC some 500 pre-recorded titles will be available from the beginning." The introduction of DCC is scheduled for the spring of 1992,

that of MD 6 months later. Sony Chairman Norio Ohga thinks that cooperation will offer tremendous growth potential for both technologies. In his opinion, this is true both for hardware and for software applications.

"We are pleased to step up our cooperation with Philips in the field of digital audio technology," says Ohga. According to a Philips spokesman, this is the first expression of support by Sony's chairman to the DCC project. Philips Chairman Jan D. Timmer is also delighted: "The successful cooperation between Philips and Sony for the development of CD technology stimulated us to join forces once again in the development of new technologies to the benefit of the consumer." As far as DCC technology is concerned, Philips has already concluded a patent agreement with Matsushita, another Japanese electronics group. Sony has nothing to do with this agreement.

It is still not clear whether or not Sony is actually going to take a license on the DCC system. If the Japanese group decides to manufacture DCC recorders, the new technology could become a major commercial success. The statement by the Philips spokeswoman indicates that the Dutch group is, for the time being, by no means thinking about taking a license for the production of MD's. In any case, the cooperation which was announced yesterday creates the necessary conditions for the successful introduction of both products. dbf pub tnd10

Europe, Japan Plan Joint Development of Fast Breeder Reactor

92WS0096C Paris LE MONDE in French 30 Oct 91
p 17

[Article by Jean-Francois Augereau: "International Partnership on Breeder Reactors"; first paragraph is LE MONDE introduction]

[Text] Europe and Japan sign scientific and technical cooperation agreement in this field....

Kyoto—On Monday 28 October in Kyoto, France, Germany and Great Britain signed an agreement with Japan that will provide for broad exchanges of information and eventually the pooling of experimentation resources for work on breeder reactors, development of which is not expected to occur before 2005-2010.

The agreement comes as somewhat of a surprise. For some time now, breeder reactors have been in the doldrums, primarily because of weakness in the uranium market (prices are at a record low) but also because of a slowdown in most nuclear power plant programs following the Chernobyl accident. Under these conditions, the principal virtue of breeder reactors—their ability to effect substantial fuel savings—has lost most of its appeal. This is especially true since few are prepared to underwrite the costs involved in developing the technology.

Evidence of this attitude is not hard to find. In 1988, the United Kingdom announced a drastic reduction in appropriations for development of these reactors, which in earlier years it had championed. More recently, in March 1991, the German Government, yielding to pressure from public opinion and certain politicians, decided simply not to put its Kalkar breeder reactor into service. The result: 7 billion German marks (23.8 billion French francs [Fr]) down the drain.

France along with other countries has felt the effects of budget constraints (the research and development budget for breeder reactors has declined from Fr900 million in 1987 to about Fr500 million today) and is waiting for these reactors—which once made it a world leader in the field [of nuclear technology]—to become operational again. That may happen soon in the case of the Phenix (250 megawatts), which recently experienced an "incident" still under investigation. Pending clarification of the facts, the industrial-scale Superphenix (1,300 megawatts), which in the past has had problems with its fuel discharging system (barrel piston chamber), will have to wait for a nod from the safety authorities. The message in France is clear: There is no room for error in such a sensitive domain.

Officials Optimistic

Given the worldwide slump in nuclear programs, one might speculate that work on breeder reactors should be postponed. That would be a serious mistake, according to experts attending the 28 October-1 November meeting on this subject in Kyoto (Japan). Obviously, none of them called for massive development of breeder reactors in the next few years. But all insisted this technology will be needed in 25 or 30 years to solve the problems of electricity production and to reduce the volume of radioactive waste generated by the power plants. In other words, it does not seem reasonable to drop the whole idea.

France, the United Kingdom and Germany understood this; in the 1980's they tried to join forces to keep up a decent level of activity in this domain. In February 1989 they signed three accords covering (respectively) cooperation in research and development, joint industrial ownership, and industrial cooperation (LE MONDE of 17 February 1991). Thus all three partners could respond, if necessary, to a request from the working group (EFRUG) entrusted by several European power companies with the task of studying a joint project to build a future European reactor (EFR). Advantages of the strategy: merging resources in a period of budgetary austerity, and affirmation of European unity in a domain in which, in the past, the nationalistic sentiments of an earlier age sometimes found expression.

Japanese Push

From this point of view, the signing in Kyoto of the accord between the Europeans and Japanese has the

virtue of creating a sort of world breeder reactor partnership. The choice of Japan was certainly significant, since that country is having less difficulty than others with its program. On the west coast, not far from Tokyo, Japan has a modest 100-megawatt installation (Joyo), and on the east coast, at Tsuruga, it has a 280-megawatt reactor (Monju) expected to enter into service in October 1992.

Finally, Japan envisages future construction of a still more powerful breeder reactor, the FBR (670 megawatts), which will prefigure the industrial-scale reactors that officials are determined to build in the next 20 years. The Japanese have also been working with the United States, interested as they are in the ambitious American waste-burning breeder reactor program developed under the leadership of General Electric.

Japan: Government Institutes, Private Industry Cooperate in Space Robotics Program

*92WS0074A Duesseldorf VDI NACHRICHTEN
in German 13 Sep 91 p 7*

[Article by Barbara Odrich: "Japanese Robots To Be Astronauts; Research Institutes Developing Remote-Controlled Machines for Space on Basis of Successful Factory Automation"]

[Text] Tokyo, VDI-N, 13 Sep 91—While the American space program with its Columbus space station is at a standstill under the pressure of costs, and the Soviet space station, Mir, must preserve its existence with commercial orders, Japan's space-travel strategists are industriously honing a future program of their own. It is based on robot technology, which is already highly developed in the island nation's factories. Such automations may also be a model for German and European programs that up to now are still oriented toward manned space travel.

Among Japan's most important contributions to the "International Space Station Project" is the "Japanese Experiment Module" (JEM), the work on which is directed by the National Space Development Agency of Japan (NASDA), the official Japanese space agency. They are at present working on a preliminary design.

The device consists of a remote manipulator system whose job is to put together the JEM and manipulate the payload on the outside of the pressurized module by remote control. In doing so, the main arm must above all be capable of handling large payloads, while a smaller arm can handle only small payloads, but can in return flexibly perform precision jobs.

In Japan the development of space robots, including the basic research on them, is pursued by several institutes under the supervision of the Ministry of Trade and Industry (MITI), the Ministry of Education, and the Science and Technology Agency. In the meantime, the Electrotechnical Laboratory (ETL), the Mechanical Engineering Laboratory [MEL], the Institute of Space

and Astronautical Science, the National Aerospace Laboratory, and the National Space Development Agency of Japan are in one form or another participating in research and development on space robots.

After all, Japanese private industry is also heavily engaged in R&D for space robots. Counted among these firms are mechanical engineering companies like Ishikawajima-Harima Heavy Industries, Kawasaki Heavy Industries, and Mitsubishi Heavy Industries, among others.

Japan's manufacturers of electronic equipment are also involved in it: Mitsubishi, NEC [Nippon Electric Company], Hitachi, Fujitsu, and Toshiba. Automobile manufacturers like Nissan and Fuji Heavy Industries are interested in it because of their background in the development of industrial robots, as are also robot manufacturers Fanuc and Yaskawa. And last, large Japanese construction firms like Taisei or Shimizu are also participating in projects. All these firms have in common the fact that they themselves have accumulated a great deal of experience in factory automation.

Generally speaking, Japanese private industry's R&D activities involving robots may be divided into six categories: These are "space mechatronics," flying mobile systems, autonomously intelligent systems, a "human robot interface," versatile remote-controlled manipulators, and simulators, as well as "ground-support systems" and earth-based support systems.

Japan's private firms are involved in research on space robots in two different ways. In one of them, firms work on numerous special technologies commissioned by national research institutes. In the other, they work on their own very promising research and development projects themselves, independently of the big research organizations.

The ETL in Tsukuba goes about its work on space robots in two different ways. In one, a "space-born" robot—that is, a robot that is brought to life in space itself—is to be developed. In the other, an intelligent telerobot is to be developed which, in part remote-controlled, will have its uses in space as well as on earth.

Since a space station is strongly disposed to automatic checkout and clearance systems, that is, remote-controlled manipulators, the "free-flying teleoperators" and robots that are responsible for construction, assembly, and maintenance in orbit, the ETL above all devotes special attention to these aspects of robotics. The ETL's space-robot research and development projects go back as far as 1982. In the process, they concentrated especially on the development of basic technology. With this in mind, a master-slave space manipulator was developed for the space effort. It is a robot with a 1-meter-long arm and a movement adjuster that was installed in a vacuum chamber for testing purposes. Special adjusting motors were developed to guarantee the vacuum characteristics that were provided.

Equipment designed for cooperation with humans is always involved. With this in mind, the ETL developed a "model-enhanced intelligent and skillful telerobot" (master). In comparison with industrial robots, such devices are much more flexible in the performance of tasks. They are in a position to deal with objects whose position is changing and whose relation to the environment is also dynamically changing.

The MEL has been working for a long time now on robots for nuclear power plants, underwater operations, and fire and disaster fighting, and, of course, on developments within the framework of "national large-scale projects of advance robot technology." Robots for hazardous missions are also developed in the Federal Republic of Germany and promoted by the Ministry for Research and Technology.

Mercedes-Benz Japan Intensifies Sales Strategy

92MI0059 Duesseldorf *HANDELSBLATT* in German
25-26 Oct 91

[Text] In addition to the new S class now being introduced to the Japanese market, at the Tokyo Motor Show Mercedes-Benz Japan Co. Ltd., Tokyo, also unveiled its 400E model, which will be on sale only in Japan and the U.S. for the time being. Mercedes-Benz Japan Chairman Michael Bassermann told the press in Tokyo that sales of 7,000 S-class cars were expected in Japan next year, one eighth of the total output, as well as 1,000 of the new 400 E.

The 400 E is a modified version of the 500 E with a 4.2-liter VB engine with four valves per cylinder, which means a V8-propelled advance into the middle market, probably in response to Japanese competition among other factors.

Bassermann stressed that Japan was Daimler-Benz's second largest foreign market in terms of revenue and its medium-term target was 1 percent market share (representing about 50,000 vehicles; the market share is currently around 0.6 percent). To this end, the sales organization was currently being extended to give a total of 240 outlets by the end of this year: apart from the Yanase organization, which still accounted for about 90 percent of all sales, 60 main centers of its own, and 15 centers belonging to its partner Mitsubishi Motors.

Concurrently with this, a 300 million German mark or so investment program was under way to set up two vehicle preparation centers, a training center, a central components store, and a regional store for the Tokyo area in Japan, Bassermann said. In addition, MB Finance will set up in Tokyo next year to provide financial services in support of sales.

In the first nine months of this year, 25,036 Mercedes-Benz vehicles were sold in Japan (11.5 percent fewer than the previous year) and 29,000 vehicles are expected to be sold over the entire year, including gray imports, compared with the 39,000 vehicles licensed in 1990.

Daimler-Benz, Mitsubishi Summit in Baden-Baden

92GE0053X Frankfurt/Main *FRANKFURTER ALLGEMEINE* in German 7 Oct 91 p 19

[Article by mih: "Daimler-Benz Holds Third 'Summit Meeting' With Mitsubishi"]

[Text] Stuttgart, 6 Oct—On Tuesday [9 October] and Wednesday the heads of Daimler-Benz and the Japanese Mitsubishi group will hold their third "summit meeting" since March 1990 at the castle hotel Buehlerhoehe near Baden-Baden where the subject of the discussion is to be close cooperation. If things were done in the style of the normally rather talkative folks from Stuttgart, then by way of contrast to that nothing at all would become known about this two-day meeting of the entire Daimler-Benz executive board with the management of the four most important Mitsubishi companies. Daimler confirms only that a meeting "will be held in Germany in mid-October." There is no other information. The justification calls for avoiding any "pressure of anticipation" in respect to the results of the meeting. Obviously no significant concrete agreements are to be expected from the meeting in Baden-Baden. And, thus, the balance sheet of success of the discussions, which have gone on for one and one-half years, shows only a single asset: the plan to cooperate in marketing Mercedes vehicles in Japan. If the comprehensive cooperation heralded after the first meeting in Singapore had given rise to the fear of a new "German-Japanese" axis in the international press, the conference in Baden-Baden stands under a different sign: Their meeting is the actual success—Daimler and Mitsubishi continue to hold discussions.

Looking for the reasons for the moderate successes of the negotiating meetings to date is first on the agenda at Baden-Baden. One reason has not been a secret for a long time: Daimler and Mitsubishi entered into the discussions with different time frames in mind. If the Germans had hoped for quick successes, then Mitsubishi's strategy from the outset was designed for the longer term. Occasionally this has raised the false impression that the Japanese are not at all seriously interested in collaborating with the Germans. Nevertheless, the Mitsubishi Corp., which represents a kind of nucleus of the rather loosely integrated Mitsubishi group mentioned, does, in the foreword to its corporate report, mention the Daimler conglomerate as a partner in the countless international discussions on cooperation. After initial irritation the Germans have now adjusted to the clearly more leisurely Asian pace.

Yet until early summer it appeared that a significant plan might be agreed upon in Baden-Baden: joint manufacture of a cross-country automobile which is designed for road transport, from 1994 on, with annual production between 20,000 and 40,000 vehicles. By way of comparison: Mercedes is currently building barely

10,000 cross-country automobiles each year at Steyr-Daimler-Puch in Austria; Mitsubishi, according to statistics from Mercedes CEO [chief executive officer] Werner Niefer, is building about 120,000 such vehicles. There was extensive agreement about the technical side of the cooperation: Basically Mitsubishi would have provided the chassis, Mercedes the rest.

The project has failed—at least for the present—because of the dispute over the “correct” price. Mitsubishi would like to classify the new vehicle in the upper price class of the Mercedes cross-country automobiles, the Stuttgart people conversely are thinking rather of the category of the Mitsubishi Pajero which is more of a bargain. Thus far, fear of competition for the vehicles within their own firm has also prevented agreement from developing on assembling the Mitsubishi small Canter van at Mercedes. The two-ton van would have drifted to the lower end of the Mercedes offerings which begin at 2.55 tons. Neither the cross-country nor the van project have, however, been permanently filed away; the discussions continue.

In a totally Japanese way the partners are also thinking of the day after tomorrow: If cooperation does not happen now, then perhaps it will when developing a successor model to the current types. Joint purchase of components as a further cooperative venture in the vehicle sector is on the agenda. In this case a short-term agreement appears possible, for, after all, stronger globalization of the acquisition activities is in the interest of both Mercedes-Benz and Mitsubishi motors. Mercedes CEO Niefer in the end repeatedly referred to this disparity: The share of orders from abroad at Mercedes so far was only slightly more than 10 percent, whereas the foreign share in all sales is more than 50 percent.

The plan for cooperation between Mitsubishi Electric and General Electric subsidiary Telefunken Electronic, Ltd. (TEG), Heilbronn, has finally become more concrete. In this connection TEG is supposed to manufacture microelectronic components for the Japanese and in return gain access to modern Far Eastern technology. However, this business is apparently not of such a magnitude as to be able to be “sold” as a result of a summit. It would be different if there were truth in the rumors that Mitsubishi Electric might participate directly in the General Electric Co., Inc. But rumor has it that so far such a commitment has not been a part of the discussions. Accordingly, capital connections will take place via joint ventures rather than via direct investment.

Volkswagen Group Increases Marketing in Japan *92MI0048 Bonn DIE WELT in German 24 Oct 91 p 11*

[Text] The Volkswagen group is launching an offensive on the Japanese car market. Together with Toyota, VW intends further expansion of its marketing structure in

the Land of the Rising Sun with a view to increasing sales of VW and Audi vehicles from the around 35,000 cars a year presently to 100,000 by the end of 1994. The group's sales network in Japan is therefore being revamped.

As VW boss Carl Hahn explained in Tokyo, in the future some 50 Toyota dealers will be selling cars made in both Wolfsburg and Ingolstadt in separate outlets. The vehicles were previously sold by the importer Yanase (about 170 showrooms) and VW-Audi Nippon (VAN, with 50 branches). At the same time, Toyota vehicles will be sold on the German market. Hahn is expecting an extra 25,000 sales per year.

“A country with a population of 100 million and an economy with an extremely high income level also has great consumption potential,” Hahn stresses. Moreover, Japan still has only half the motor vehicle density of Germany. “This is an exploding market.” What is more, Japan is surrounded by regions of high economic growth, such as China, that want to share in the growing affluence. For years, the Japanese government isolated the country until its industry was able to hold its own on the world market. Now, Hahn continues, they have realized that anyone who wants to export must import as well. The increasing cooperation between Japanese industry and European manufacturers is also a result of government recommendations. The joint scheme that has just been agreed upon could expand VW/Audi's share of the Japanese market from its present one percent. The VW group accounts for about 25 percent of all foreign car imports.

According to the VW chief, the problem in Japan is the “astronomically high rents, land prices, and cost of living.” This means that a European car manufacturer can hope to increase sales only by extending its sales network and not by transplanting (manufacturing cars in the foreign country itself), as the Japanese are doing in Europe. He sees the strategic alliance between VW and Toyota as a first step in this direction.

Volkswagen, Suzuki To Form Small Car Partnership

92P60070A Brussels EUROPE in English 6 Nov 91 p 7

[Text] Japanese manufacturer Suzuki Motor and German Volkswagen are to enter into partnership for the design and manufacture of a car with small cylindrical capacity in Europe. They have reached an agreement of principle the details of which should be finalised in May-June 1992. The German group has signed this agreement on behalf of its Spanish affiliate SEAT, which will produce and market the future car, mainly in Europe.

Japanese Chemical Firm To Increase Joint Ventures in Europe

92MI0097 Duesseldorf *HANDELSBLATT* in German
5 Nov 91 p B7

[Article by Andreas Gandow: "Toray Industries Want To Increase Research and Development Cooperation With European Partners"]

[Text] Japan's leading manufacturer of synthetic fibers, plastics and composites, pharmaceuticals, and chemicals, Toray Industries Inc., Tokyo, intends in the years ahead to increase its European involvement in fine chemicals and textile fibers, expand its French production base for carbon fibers, and increase cooperation with European firms in research and development, Board members Junichi Kabe (International Division) and Hidetane Iijima (Planning and Personnel) told *HANDELSBLATT* in an interview on the firm's European strategy.

This summer the firm adopted a strategic schedule for the last 10 years of the century that is designed, Iijima said, to take particular account of the fundamental worldwide changes in trade and politics, the changes in exchange rates, the changed work attitudes of the labor force, and the shortage of labor in Japan. The letter "G" in the name of this strategic plan, "Action Program—G2000," stands for "Growth," "Group Management" (the simultaneous expansion of an alliance of group companies), and "Globalization."

Business Expansion

In this connection, Iijima stressed that the objective of the plan to develop a "universal alliance of chemical firms operating on a world scale" is to give a clear direction to the whole group, to give the entire workforce a point of reference, and lastly to give all business sectors a strategic orientation. But the plan also says something about the level of growth being pursued: Sales are to be doubled from the 980 billion yen [Y] target for the current fiscal year 1991/92 (April to March) to Y2,000 billion by the year 2000, which means that an overall rate of business expansion higher than Japan's nominal rate of economic growth is aimed for. Although the proportion of sales represented by synthetic materials will fall from the present 66 to 55 percent (in real terms around 13.75 billion German marks [DM]), the proportion represented by advanced products and finished products is to increase from 18 to 25 percent (in real terms about DM6.25 billion), and by "human services" from 16 percent to 20 percent (in real terms about DM5 billion).

The work schedule distinguishes between "strategic expansion areas" and "strategic development areas":

- Business is to be expanded in the textile fiber, plastics (plastic materials, heavy-duty foils), fine chemicals, and composites sectors, seeking to achieve a leading international position in all these fields, and in textile

fibers explicitly the world lead. In concrete terms, as far as synthetic fibers are concerned this means beating rivals Dupont and Hoechst to the top of the world league table.

- Areas for future business development in advanced materials and finished products are:
 1. Global involvement in pharmaceuticals (interferon), medical technology (membranes, artificial organs, contact lenses, diagnostics), and health care;
 2. Stepped-up global involvement in materials for the electronics and photographic industries (special films for integrated circuits, filters for liquid crystal screens, optical fibers, printed circuit boards);
 3. Entry into the building materials and residential building sectors and into water purity-related environmental technologies;
 4. Involvement in the building and processing of large structures in carbon fiber-reinforced plastics in connection with motor vehicle, railway wagon, and aircraft manufacturing. The firm says that it already has a share of just under 40 percent in the world PAN (polyacrylonitrile) carbon fiber plastic market.
- Finally, the schedule cites a wide-ranging involvement in fashions, its work as an international trading company, information retrieval, and the leisure sector as areas for strategic development in the human services sector.

Radical Rejection of the "Ringi" System

Speaking of the organizational and decision-making structures underlying this framework for future business strategy, Iijima explained that, alongside departments managed on a purely hierarchical basis, which were nonetheless characterized by a clear assignment of responsibilities, service departments (planning, international business, coordination with group enterprises) staffed by specialists working on equal terms had been created as early as the mid 1960's.

At the same time, Iijima went on, there had been a fundamental rejection at the top, with consequences for the lower levels of decision-making, from the "ringi" bottom-up decision-making system, since this cooperative process had assigned no clear responsibility, which meant that ultimately no one had been responsible. Instead, the principle of "sole decision-making powers and sole responsibility" had been introduced, which applied even at the highest levels, where decisions were not taken by a majority but by the chairman on his sole responsibility, Iijima explained. Apart from that, there was a jurisdiction and responsibility rule only in so far as certain decisions could be taken only by the board. It was up to those making decisions at a lower level to use the

room for maneuver that this left, and, unlike rigid compartmentalization, this was a positive factor for growth, Iijima emphasized.

The preparatory work for the company chairman's decisions is done by two merely advisory bodies: a twice-monthly "core board" meeting that deals with matters of principle, and the monthly meeting of the Board of Managing Directors, which discusses detailed company planning projects and measures for implementing the plan. The work of both bodies is embedded in a schedule with a three-month lead time, which allows sufficient examination and discussion, but which above all gives the entire decision-making process a rational planned framework, Iijima explains: "This clear attribution of powers allows no one within the organization to evade his responsibilities and it helps to vitalize management and keep the company on its toes."

Putting the new strategic plan into effect did not therefore involve any change in these arrangements. The global involvement would still be directed centrally by the various business sectors in the future too, and there were no plans to create regional offices, Iijima emphasized.

Business involvement on the European market did not begin until the mid-1970's, after factories producing textile fibers were built in Asia. Apart from trading companies in Germany, Great Britain, and Italy, which also export fashion articles to Japan, the company currently has three production centers in Europe with a total of 1,100 employees and sales amounting to about DM375 million, Junichi Kabe explained:

- In Italy artificial suede is being made at Alcantara S.p.A., Milan, in a joint venture with the ENI group. Kabe thinks it likely that, in addition to expanding capacity in the years ahead, further products will be added to this factory's range.
- In France, Toray Industries has held 70 percent of the capital in Societe des Fibres de Carbone S.A. (SOFICAR), Mourenx, since September 1989. This company manufactures and markets the PAN carbon fiber plastic developed by the Japanese company. The main customer is the aircraft industry, where the material is used in the construction of Airbus, for example. Because of the strategic significance of this material, this production base was supported by the French government as part of its industrial policy. Kabe said that the manufacture of components and finished products for the motor industry, for example, would be stepped up in the future. This material was also used in civil engineering and bridge building and to produce extremely long pipes for oil pipelines and water mains.
- Finally, the British polyester weaving and dyeing company Samuels Courtauld, Nottingham (Courtauld Group plc) was taken over in early 1989 to establish a bridgehead for the textile fiber business in the European Community. This company has a 40-percent

share of the EC market in thick polyester textile fabrics. The production facilities of what is now Toray Textiles Europe Ltd were currently being modernized with an investment equivalent to just under DM200 million and extended with the building of a factory that would enable it to handle Japanese yarns for particularly fine, silky fabrics for women's clothing in addition to the yarns already bought locally. This planned expansion of the product range, with the technical assistance and capital participation of the Japanese textile companies Komatsu Seiren and Hosokawa Kigyo, is intended to double the firm's sales to the equivalent of DM250 million by 1995.

Although this would initially involve supplying textile fiber yarn from Japan and from a factory that was currently being built in Thailand, if a suitable scale were achieved another similar factory might subsequently be built in Europe, if possible in conjunction with a European partner, Kabe explained. Unlike the American market, the European fashion market was very sophisticated and thus held out interesting business prospects for the company's fine polyester fabric.

The now four-strong European Office in London is responsible for developing the company's future European strategy, obtaining and evaluating information, and appraising potential projects. Apart from the projects and plans to expand existing operations in Europe, Kabe mentioned two other areas in which Toray Industries wants to increase its presence in the EC in the future:

1. Expansion of business in fine chemicals, either jointly with a European partner or by buying a company. In this regard Kabe said that a number of options were currently being examined, but no definite decisions had yet been taken.
2. Although Toray Industries was not planning to establish R&D bases in America and Europe, even in the context of globalizing its business activities, there was great interest in undertaking joint development projects with European partners in the future. This went for partners in Germany, particularly regarding large wagon and vehicle components, in the light of their know-how in carbon fiber-reinforced materials, Kabe stressed.

Merck Plans Liquid Crystal Production in Japan

92GE0102X Frankfurt/Main FRANKFURTER
ALLGEMEINE in German 19 Nov 91 p 23

[Article by P.O.: "Merck Plans Large Investments in Japan. Most Important Market for Liquid Crystals. Plant to Be Built"]

[Text] Tokyo—Anyone who speaks of the by and large remarkably successful German chemical industry in Japan usually refers to the three IG Farben successors. However, the Merck group has been working just as long and with equal success in this market. As president of Merck Japan Ltd., Klaus Diehl reports that this year Merck anticipates worldwide sales on the order of 4

billion German marks [DM], in which the Japanese subsidiary group has a share of 10 percent or about DM400 million. Merck has succeeded in adapting to the special requirements of the Japanese consumers.

As early as 1968 the present Merck Japan Ltd. was founded for marketing chemicals and reagents. At the same time this company also distributed pharmaceuticals and issued licensing agreements. Merck has had its own color pigment application technique in Japan since 1976. The consumers of color pigments in Japan include the automobile industry, producers of synthetic materials, and paper manufacturers, among others.

Merck has been producing liquid crystal mixtures in Japan since 1984. Based on the entire world, Merck has a market share of approximately 50 percent for liquid crystals. Since 70 percent of the world consumption of this expensive chemical product—one kilogram costs

about DM15,000—is sold to the Japanese electronics industry and an additional 25 percent to the nations of Southeast Asia, according to Diehl the establishment of a full-standard liquid crystal production in Japan—in contrast to the previous manufacture of mixtures—is “more than obvious.” The building site for the liquid crystal plant is already available. The required investment sum, about DM100 million, is considerable even for Merck. Production is to begin in the spring of 1994. Similar to the Japanese electronics industry, which is currently investing approximately DM2 billion in the applications of liquid crystal display technology, Merck also sees an extremely large market ahead. Among the most promising products is a large, flat wall screen, on which during the day for example a Van Gogh picture may be seen and at night the television program in wonderful colors and sharpness of image.